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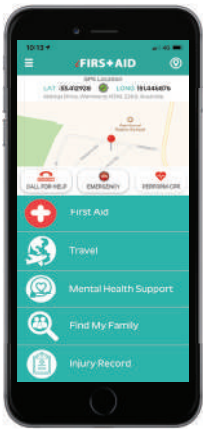


# FIRST AID

# e EMERGENCY HANDBOOK

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# About this *e*Handbook

This electronic version of the award winning *First Aid Emergency Handbook,* 6th edition (***e***Handbook) provides a quick summary of first aid for a range of every day emergencies whether at work, in sport or recreation, or at home. The ***e***Handbook does not attempt to replace the need for medical advice but gives an outline of what to do in the first few minutes after the onset of sudden illness or an accident.

The first aid management recommended in this book is correct at the date of publication and in line with the current guidelines of the Australian Resuscitation Council (ARC) and the Australian and New Zealand Committee on Resuscitation (ANZCOR), Poisons Information Centre and other professional bodies concerned with emergency care.

Because these recommendations change as a result of medical research and new knowledge, it is vital to update this ***e***Handbook and your first aid training at regular intervals, approximately every three years. When there are new changes we will send you a email reminder.

Keep a comprehensive first aid kit available for immediate use in an easily found location. If it is for workplace use, check that it meets the relevant legislative requirements. Record all items used and keep spare stock available to replenish the kit as needed.

# How to use the *e*Handbook

The tabs at the side and the Index provide a quick link to each topic. The Glossary gives a simple guide to the terms used in the ***e***Handbook.

Resuscitation for an adult, child and baby is dealt with separately. Where roller bandages have been used to illustrate a technique, the bandages are marked with a dark edge as an aid to learning.

The Skills and Procedures section covers the following topics:

- Principles of first aid
- Assessment of a sick or injured person
- First aid and safety
- Emergency procedures
- Infection control in first aid
- Dressing and bandages
- Systems of the human body.

## About the author

Ella Tyler is a Registered Nurse and Midwife with two degrees in Adult Education. She has been involved with first aid teaching and instructor training for over 30 years and was a former Deputy Chairman of the Australian Resuscitation Council. In 1985, Ella was awarded the International Florence Nightingale Medal. Currently Ella works in her own business as a first aid training consultant. She is author or editor of 22 first aid books.

## About the publisher and copyright holder

This electronic version of the *First Aid Emergency Handbook,* 6th edition, was first published in Australia in September 2021 by © 2021 Survival IP Proprietary Limited.

ISBN 9333096002483

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# How to call for help in an emergency

When possible, the person with the best first aid knowledge should stay with the victim while someone else calls for the emergency service.

**1 To call for the Ambulance, Police or Fire Service, use 000 for all fixed line telephones.**

- If you a e using a digital mobile phone, call either **000** or the International Emergency Number **112**

**2 When the emergency operator answers, state clearly which service is required.**

**3 Stay calm and speak clearly to convey the message. Be ready to answer any questions.**

**4 State the following:**

- the exact location with any clear landmarks or identification points;
- an outline of the emergency;
- the number of victims involved
- any information about the condition of the victim(s)
- any hazards relevant to the area, such as fire, chemical spill, fumes;
- the telephone number where the caller can be contacted in case further information is needed.

**5 Wait on line until the operator tells you to hang up.**

**6 Ask someone to stay in a prominent position to direct the emergency service vehicle to the correct area.**

Fire, Police or Ambulance **000** or mobile **112**

Poisons Information Centre **13 11 26**

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# Basic Life Support Flow Chart

**D** ↓ Check for Dangers

**R** ↓ Check Response

**S** ↓ Send for help

**A** ↓ Clear and open the Airway

**B** ↓ Check for normal Breathing

**C** ↓ Give 30 chest Compressions at 100 - 120 per minute, followed by 2 rescue breaths

**D** ↓ Defibrillate - attach AED as soon as available. Follow the prompts

**Continue CPR until qualified personnel arrive or normal breathing returns.**

**Monitor recovery until responsive.**


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# ADULT Resuscitation

## Background

A person may collapse following injury or sudden illness and sometimes may need Cardiopulmonary Resuscitation (CPR).

Some victims may be unconscious and simply need protection to avoid further harm.

Others will need urgent Cardiopulmonary Resuscitation (CPR) to maintain life.

CPR is needed when there are no signs of life and the victim is:

- unconscious and not responding to the first aider's voice and touch
- not breathing normally

All collapsed victims should be carefully assessed to decide what emergency care is needed. The DRSABCD of resuscitation is the method used for the assessment:

D stands for DANGER
R stands for RESPONSE
S stands for SEND (for help)
A stands for AIRWAY
B stands for BREATHING
C stands for COMPRESSIONS
D stands for DEFIBRILLATION

## What to do — step by step

### 1 Assess any Danger

- Only approach the collapsed person if you believe that it is safe to do so. Check for any danger in the immediate area, especially traffic, electrical hazards, etc.

### 2 Assess the victim's Response

- If it is safe to continue, check for response by"talk and touch", then grasp and squeeze the shoulders firmly. Use simple commands such as "Can you hear me?", "Open your eyes.", "What's your name?", "Squeeze my hand; let it go". If the victim responds, then gently and quietly assess the cause of the apparent collapse.

Persons who may have taken an excessive amount of alcohol or drugs may be aggressive and react unexpectedly. Avoid being too close to the victim if you are unsure of your safety.

- If there is no response to your voice or touch, the victim is unconscious and needs you to protect the airway and ensure that there is no immediate threat to life.

Call 000 or mobile 112 for an ambulance.

### 3 Clear and open the Airway

- Either leave the unconscious person in the position found to clear and open the airway OR
- Turn the unconscious person into the recovery position on the side.

**If the victim has been rescued from submersion or has vomit, blood or other fluid in the upper airway, always use the recovery position to clear the airway.**

### THE RECOVERY POSITION

- Place the far arm at right angles to the trunk and the near arm across the victim's chest with the fingers pointing to the opposite shoulder tip. Support the arm in that position.
- Bring the near knee up at right angles so the chest and support under the thigh in that position with your lower arm.

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# ADULT resuscitation

- Lift under the victim's near shoulder and thigh to gently roll the victim away from you and into a stable position on one side.
- Keep the victim's knee and hip at right angles during the turn to keep the victim lying on the side, avoiding any excessive movement into a face-down position.
- Allow the victim's upper arm to fall across the lower arm in a natural position.

- Check that the victim's airway is clear by sweeping two or three fingers through the front of the mouth to remove any solid matter.

- If a broken tooth is found, remove it promptly to avoid the risk of inhalation into the airway.
- Loose dentures should be removed for safety, but well-fitting ones should be left in place.

- Then tilt back the head slightly with you upper hand on top of the victim's head. With your lower hand, support the jaw and lift the chin to ensure that the tongue is held forwards in the mouth. Because the tongue is attached to the back of the lower jaw, this simple movement prevents the tongue from falling backwards to block the throat.
- Make sure that the face is pointing slightly downwards.

## 4 Check for breathing

- When the airway is clear and open

~ **Look** for movement of the lower chest and upper abdomen.

~ **Listen** for the escape of air from the victim's mouth or nose.

~ **Feel** for movement of the lower chest and abdomen and for the escape of air from the victim's mouth or nose.

~ **Check** for **normal** breathing but ignore occasional gasps which are inadequate to maintain life.

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# ADULT resuscitation

## 5 If the victim is breathing normally

- Adjust the recovery position if necessary to ensure stability.
- Cover the victim with a blanket in cool weather or a light covering in hot weather.
- Check the airway and signs of recovery every few minutes and begin CPR if normal breathing stops.

## 6 If the victim is NOT breathing normally

- If necessary, quickly roll the victim onto the back to begin CPR.
- First locate the centre of the chest checking that your hand is on the victim's sternum (breastbone) and not below it and over the abdomen.

**Avoid compressing too high or too low by quickly finding the notch where the ribs meet in the centre.**

- Place your lower hand above this point and your other hand on top of the first and obtain a secure grip to avoid accidental slipping out of position. A secure grip is one in which the upper hand grasps the lower wrist with the thumb locked behind the wrist. Alternatively, interlock the upper and lower fingers firmly together to hold them off the chest wall and avoid any downward pressure on the rib cage.
- Ensure that the heel of the hand is in the midline of the sternum (breastbone) and all pressure is exerted through the heel of the lower hand.

## 7 Compress the sternum

- Kneel close to the side of the victim with both arms locked straight at the elbows and your shoulders directly above the victim's sternum. With your hands on the chest exert downward pressure through the sternum without any pressure on the rib cage.
- Compress the sternum by pushing downwards on straight arms to depress the breastbone one-third of the chest depth. When resistance is felt, no further pressure should be applied, but the arms should relax a little as the compression ceases.
- The first aider should maintain compressions at the rate of approximately 100 per minute until a total of 30 have been given.
- Follow the compressions immediately with two breaths of rescue breathing.

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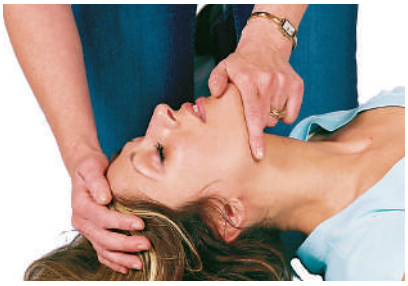
# ADULT resuscitation

## 8 Rescue Breathing

- For mouth-to-mouth rescue breathing, tilt back the victim's head with your upper hand and support the jaw with chin lift using the lower hand. Use a 'pistol grip' to maintain control of the jaw. Avoid lifting or tilting the neck, especially when a neck injury is suspected.



- Take a deep breath in and seal the victim's mouth with your mouth. Seal the victim's nose with your cheek so that air does not escape. If unable to seal the nose with your cheek, pinch the nostrils closed.

**If the nostrils are sealed with your fingers, some head tilt may be lost when the hand on top of the head comes forwards. Firmly lifting the chin upwards with your lower hand can reduce this problem and avoid a see-sawing movement of the head.**

- Breathe into the victim's mouth until the chest rises, as for normal breathing.

- Remove your mouth from the victim's face and turn your head towards the victim's chest to listen and feel for air leaving the mouth and nose, and to watch the chest empty. Be careful to avoid inhaling the victim's exhaled air.

- When the chest is empty, repeat these steps one more time to give a total of two breaths of rescue breathing, allowing about one second for each breath.
- Mouth to nose rescue breathing may be used when the victim's teeth are tightly clenched or when giving rescue breathing to an infant or small child.

**If you are unable to give rescue breaths, continue with compressions alone.**

**Gloves are unnecessary as the cross-infection risks during CPR are negligible.**

### Mouth to mask Rescue Breathing

- Ideally position yourself at the head of the victim, looking towards the feet. Use both hands to support the jaw with your fingers behind the angle of the jaw and maintain backward head tilt and chin lift.

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# ADULT resuscitation

- Place the mask on the victim's face, with the pointed end covering the bridge of the nose.
- Seal the rounded end on the victim's chin and ensure that both mouth and nose are totally enclosed in the mask to make a total seal.
- With the mask held firmly on the face, push down with your thumbs on either side of the mouthpiece. Pull the jaw up into the mask to ensure a good seal.
- Blow through the mouthpiece with sufficient volume until the chest is seen to rise.

- Remove your mouth and turn your head to the side to listen as the exhaled air escapes; watch the chest fall.

- If the chest fails to rise with each breath, recheck head tilt, chin lift and mask seal on the face. Sometimes a slight change of position may be effective.

## Two person CPR

- If a second person arrives continue the ratio of 30 compressions to two breaths, but the compressor must pause to allow the ventilations to occur.

**The two first aiders may change over when either feels tired or stressed by their activity. This may be every two minutes or more frequently, to avoid the compressor being exhausted.**

The change-over should be done without interruption to the ratio of breaths to compressions and in the middle of a compression cycle.

**If regurgitation occurs during CPR, quickly roll the victim onto the side to recheck and clear the airway. Then continue CPR.**

## 9 Check for recovery

- Check constantly for any signs of recovery including normal breathing, coughing or movement.

## 10 If signs of recovery are seen

- Turn the victim on the side into the recovery position and make further checks every few minutes until either the victim starts to regain consciousness or an ambulance arrives.

## 11 Be ready to defibrillate when an AED becomes available

- Apply an AED (Automated External Defibrillator) as soon as possible and follow the prompts - See Defibrillation

## 12 When to stop resuscitation

- Resuscitation should continue until
  - ~ the victim recovers
  - ~ qualified help arrives and takes over
  - ~ an authorised person pronounces that life is extinct
  - ~ the first aider is unable to continue, usually due to exhaustion.

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# ADULT Defibrillation

## Background

When a victim of a heart attack collapses, a defibrillator may be needed to restore a normal heart rhythm. If the heart muscle is quivering (ventricular fibrillation) use of an Automated External Defibrillator (AED) may restore normal heart rhythm and thus be life-saving.

In cardiac arrest, when the heart is no longer beating or quivering, a defibrillator is unlikely to be of value, but should be applied and left in place. An AED can assess any heart action and will only deliver a defibrillation shock if this is warranted.

If an AED is available and trained first aid personnel are present, e.g., in a workplace or large shopping centre, standard CPR should be commenced and continued until the AED is completely ready for use. An AED does not replace CPR but is and extra step in emergency care until the arrival of an ambulance with additional life-saving techniques.

## What to do — step by step

**The defibrillation unit should only be attached to a victim over 8 years of age who has collapsed and is unconscious, with no response and no normal breathing.**

### 1 Prepare defibrillator

- If possible, continue CPR while someone else fetches and prepares the defibrillator.

### 2 Expose the victim's chest

- Dry the skin if necessary to improve adhesive contact with the pads.
- If the victim has a very hairy chest, quickly trim the hair on the upper right side of the chest.

### 3 Turn on the defibrillator and follow the voice prompts

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# Adult defibrillation

- Identify the two pads which are usually supplied with a clear diagram for their location. The underside of the pad is usually coated with a sticky gel to ensure adhesion to the chest. Remove any backing paper.
- One pad is placed on the victims' **right** upper chest, and the other is placed on the **left** lower chest. Both pads should be pressed down firmly for a good contact. The voice prompt will advise "check electrodes" if the pads are not making good contact.

## 5 Prepare to defibrillate

- When the unit is ready to analyse the victim's heart rhythm, the voice prompt will advise everyone to avoid any contact with the victim. This is to avoid any interference with the analysis. If the victim has a rhythm that is likely to respond to defibrillation, the voice prompt will advise everyone to "Stand Clear" ready for the shock to be given.

## 6 Delivery of the shock

- The trained first aider must quickly check that no person is in contact with the victim, call out "Shocking now" before pressing the "shock" button.

- When the defibrillation shock has been given the voice prompt will advise the first aider to continue with CPR. After two minutes when the unit is ready to analyse the victim's heart rhythm again, the first aider will be told to stop CPR and, if necessary the defibrillator will advise a further shock.

## 7 Follow-up care

- This cycle of analysis, shocks and CPR will continue if the defibrillator senses that the heart may respond to repeated shocks.
- The unit should remain connected and the voice prompts followed until the ambulance crew arrive even if the victim recovers and is turned into the recovery position.

**For a child aged one to eight years a child-safe AED should be used with special leads and pads. If this is not available, an adult AED may be used in an emergency.**

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# CHILD Resuscitation

**Care is needed when giving resuscitation to a child aged between one and eight years.**

## 1 Assess any Danger

- Only approach the child if you believe that it is safe to do so. Check for any danger in the immediate area, especially traffic, electrical hazards etc.

## 2 Assess the child's Response

- If it is safe to continue, check if the child responds to the spoken word. Ask loudly and firmly: "Can you hear me?", "Are you OK?" or "What happened?" Give a squeeze of the shoulders and watch for any reaction. If the child responds, then gently and quietly assess the cause of collapse.

- If there is no response, or only a minor response to your voice or touch, the child is unconscious and needs your help to protect the airway and ensure that there is no immediate threat to life.

Call 000 or mobile 112 for an ambulance.

## 3 Clear and open the Airway

- Either leave the unconscious child in the position found to clear and open the airway

  OR

- Turn the unconscious child into the recovery position on the side.

**If the victim has been rescued from submersion or has vomit, blood or other fluid in the upper airway, always use the recovery position to clear the airway.**

### THE RECOVERY POSITION

- Place the far arm at right angles to the trunk and the near arm across the child's chest with the fingers pointing to the opposite shoulder tip. Support the arm in that position with your upper arm.
- Bring the near knee up at right angles to the chest and hold the thigh in that position with your lower arm.

- Lift under the child's near shoulder and thigh to gently roll the victim away from you and into a stable position on one side.
- Keep the child's knee and hip at right angles during the turn to keep the victim lying on the side, avoiding any excessive movement into a face-down position.

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- Allow the child's upper arm to fall across the lower arm in a natural position.

- Check that the child's airway is clear by sweeping one or two fingers through the front of the mouth to remove any solid or loose matter.

- If a broken tooth is found, remove it promptly to avoid the risk of inhalation into the airway.
- Check that the child s nose is clear and quickly wipe away any mucus or other discharge that could obstruct the movement of air.
- Tilt back the head very slightly with you upper hand on top of the child's head. With your lower hand support the jaw and lift the chin slightly. Because the tongue is attached to the back of the lower jaw, this simple movement prevents the tongue from falling backwards to block the throat.

- Make sure that the face is pointing slightly downwards.

**In a child it is vital to maintain jaw support with chin lift because of the large amount of soft tissue in the mouth and throat, which can cause an airway obstruction.**

## 4 Check for Breathing

- When the airway is clear and open

~ **Look** for movement of the lower chest and upper abdomen.

~ **Listen** for the escape of air from the child's mouth or nose.

~ **Feel** for movement of the lower chest and abdomen and for the escape of air from the child's mouth or nose.

~ **Check** for **normal** breathing but ignore occasional gasps which are inadequate to maintain life.

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# CHILD resuscitation

## 5 If the child is breathing normally

- Adjust the recovery position if necessary to ensure stability.
- Cover the child with a blanket in cool weather or a light covering in hot weather.
- Check the airway and signs of recovery, every few minutes and begin CPR if normal breathing stops.

## 6 If the child is NOT breathing normally

- If necessary quickly roll the child onto the back to begin CPR.
- First locate the centre of the chest, checking that your hand is on the child's sternum (breastbone) and not below it and over the abdomen.

**Avoid compressing too high or too low by quickly finding the notch where the ribs meet in the centre.**

- Place the heel of one hand over the lower half of the sternum (breastbone). Keep the heel of the hand in contact with the sternum and fingers facing across the chest.

## 7 Compress the sternum

- Kneel close to the side of the child, with your arm locked straight at the elbow and your shoulder directly above the sternum.
- Keep your hand on the chest to exert downward pressure through the sternum without any pressure on the chest wall or rib cage.

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# CHILD resuscitation

- Compress the sternum by pushing downwards on a straight arm to depress the breastbone one-third of the depth of the chest. When resistance is felt, no further pressure should be applied, but the arm should relax as the compression ceases.
- If necessary, use two hands to achieve adequate compression.
- The first aider should maintain compressions at the rate of approximately 100 per minute until a total of 30 have been given.
- Follow the compressions immediately with two breaths of rescue breathing using either the mouth-to-mouth or mouth-to-nose resuscitation method. Then give a further 30 compressions.

## 8 Rescue Breathing

- Begin rescue breathing using either the mouth-to-mouth or mouth-to-nose resuscitation method.
- Tilt back the child's head very slightly with your upper hand and support the jaw with chin lift using your lower hand. Use a "Pistol Grip" to maintain control of the jaw. Avoid lifting or tilting the neck, especially where a neck injury is suspected.

**Avoid full head tilt because this can obstruct the airway of a young child and may cause unnecessary stress to the neck spine.**

- Take a small breath in and seal the child's mouth with your mouth. Seal the child's nose and blow gently into the child's mouth until the chest rises, as for normal breathing.

**If the child is very small it is best to seal both nose and mouth with your mouth during rescue breathing.**

**If there is resistance to each breath, gently try a little more head tilt until an even flow of air is achieved.**

- Remove your mouth from the child's face and turn your head sideways to listen to the escape of air and watch the chest empty. Be careful to avoid inhaling the child's expired air.

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- When the chest is empty, repeat these steps one more time to give a total of two breaths of rescue breathing, allowing about one second for each breath. Mouth-to-nose rescue breathing may be used when the child's teeth are tightly clenched.

**It is easy to breathe too hard into a small child and some distension of the abdomen may be seen. If this occurs, simply turn the child into the recovery position and clear and open the airway again. If the stomach is distended with air, it will be expelled during the change of position. Then, quickly turn the child onto the back once more and continue resuscitation.**

**DO NOT apply pressure over the stomach or abdomen because this can lead to regurgitation of stomach contents with the risk that some material may be inhaled into the lungs, causing fatal complications.**

## Two person CPR

- If there are two first aiders present and sharing the resuscitation tasks, the ratio of 30 compressions to two breaths should be maintained but the compressor must pause to allow the ventilations to occur.
- When the first aider performing the compressions is getting tired, the two first aiders should change over roles. It is best to do this in the middle of the 30 compressions to avoid any unnecessary interruptions to CPR.

## 9 Check for signs of recovery

- Check for signs of ecovery including normal breathing or coughing.

## 10 If signs of recovery are seen

- Turn the child on the side into the recovery position and make further checks every two minutes until either the child starts to regain consciousness and responds to your voice or touch, or an ambulance arrives.

## 11 Be ready to defibrillate when an AED becomes available

- Apply an AED (Automated Externa Defibrillator) as soon as possible and follow the prompts

**It is best to use a child-safe AED with special settings, leads and pads. For a child the pads should be placed with one slightly to the centre left of the child's chest and the second pad in the centre of the back between the shoulder blades.**

**When an ambulance arrives, the first aider should not stop resuscitation efforts until told to do so by the ambulance officers. The officers may need time to assemble their equipment before being ready to take over full responsibility for performing resuscitation.**

## 12 When to stop resuscitation

- Resuscitation should continue until

~ the child recovers

~ qualified help arrives and takes over care of the child

~ an authorised person pronounces that life is extinct

~ the first aider is unable to continue, usually due to exhaustion.

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# BABY Resuscitation

**Special care is needed when giving resuscitation to a baby aged up to one year.**

## 1 Assess any Danger

- Only approach the baby if you believe that it is safe to do so. Check for any danger in the immediate area, especially traffic, electrical hazards etc.

## 2 Assess the baby's Response

- If it is safe to continue, check if the baby responds to your voice. Call the baby loudly and firmly by name. Give a gentle squeeze of the baby's toes. If the baby responds to your voice or touch, then gently and quietly assess the cause of collapse.

- If there is no response or only a minor response to your voice or touch, the baby is unconscious and needs your help to protect the airway and ensure that there is no immediate threat to life.

Call 000 or mobile 112 for an ambulance.

## 3 Clear and open the Airway

- Either leave the unconscious baby in the position found to clear and open the airway

  OR

- Promptly turn the unconscious baby into the recovery position on the side.

**If the baby has been rescued from submersion or has vomit, blood or other fluid in the upper airway, always use the recovery position to clear the airway.**

### THE RECOVERY POSITION

- Roll the baby over onto one side using the hip and shoulder to control the turn.

- Keep the baby's knee and hip under control to maintain a stable position on the side. Avoid any further movement into a face-down position.

- Check that the baby's airway is clear by sweeping one finger through the front of the mouth to remove any solid or loose matter.

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- Check that the baby's nose is clear and quickly wipe away any mucus or other discharge that could obstruct the movement of air.

**A small baby breathes through the nose in the early stages of development and a blocked nose can cause a serious obstruction**

- With your lower hand support the jaw and lift the chin slightly to ensure that the tongue is held forward in the mouth. Because the tongue is attached to the back of the lower jaw, this simple movement will prevent the tongue from falling backwards to block the throat. Avoid head tilt for a baby but make sure that the face is pointing slightly downwards.

**In a baby it is vital to maintain jaw support because of the large amount of soft tissue in the mouth and throat, which can cause an airway obstruction.**

## 4 Check for breathing

- When the airway is clear and open:

~ **Look** for movement of the lower chest and upper abdomen.

~ **Listen** for the escape of air from the baby's mouth or nose.

~ **Feel** for movement of the lower chest and abdomen and for the escape of air from the baby's mouth or nose.

~ **Check** for **normal** breathing but ignore occasional gasps which are inadequate to maintain life.

## 5 If the baby is breathing normally

- Adjust the recovery position if necessary to ensure stability.
- Cover the baby with a blanket in cool weather or a light covering in hot weather.
- Check the airway and signs of life every few minutes and be prepared to begin CPR if normal breathing stops.

## 6 If the baby is NOT breathing normally

- If necessary, quickly roll the baby onto the back to begin CPR.
- First locate the centre of the chest, checking that your hand is on the baby's sternum (breastbone) and not below it on the abdomen.

**Avoid compressing too high or too low by quickly finding the notch where the ribs meet in the centre.**

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- With your fingers follow up the borders of the rib cage to the middle of the chest and identify the notch where the ribs meet in the centre.

- Mark this notch with an index finger and place two fingers just above it, which will be over the lower half of the sternum.

## 7 Compress the sternum

- To give compressions, keep your finger tips on the chest to exert downward pressure through the sternum without any pressure on the rib cage. Stay close to the side of the baby, with your fingers directly above the sternum.

- Compress the sternum by pushing downwards to depress the breastbone to one-third of the depth of the chest. When resistance is felt, no further pressure should be applied, but the arm should relax as the compression ceases.
- The first aider should maintain these compressions at the rate of approximately 100-120 per minute until 30 compressions have been given.
- Immediately follow the compressions with two puffs of rescue breathing and then give a further 30 compressions.

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## 8 Rescue Breathing

- Begin rescue breathing using the mouth-to-mouth-and-nose method of resuscitation.
- Hold the baby's head level with your upper hand and support the jaw with chin lift using your lower hand. Use the "Pistol Grip" to maintain control of the jaw.

**Avoid head tilt on a baby because this can obstruct the airway and may cause unnecessary stress to the neck spine. If there is resistance to each breath, try a gentle head tilt until an even flow of air is achieved.**

- Take a small breath in and seal the baby's mouth and nose with your mouth. Puff gently into the baby's mouth until the chest rises, as for normal breathing.

- Remove your mouth from the baby's face and turn your head sideways to listen to the escape of air and watch the chest empty. Be careful to avoid inhaling the baby's expired air.

- When the chest is empty, repeat these steps one more time to give a total of two puffs, allowing about one second for each one.

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It is easy to breathe too hard into a small baby and some distension of the abdomen may be seen. If this occurs, simply turn the baby into the recovery position and clear and open the airway again. If the stomach is distended with air, it will be expelled during the change of position. Then turn the baby onto the back once more and continue resuscitation efforts.

Pressure should not be applied over the stomach or abdomen because this can lead to regurgitation of stomach contents with the risk that some material may be inhaled into the lungs, causing fatal complications.

## 9 Re-check for signs of recovery

- Check for signs of recovery including normal breathing or coughing.

## 10 If signs of recovery are seen

- Turn the baby on the side into the recovery position and make further checks every two minutes until the baby either regains consciousness and responds to your voice or touch, or an ambulance arrives.

## 11 When to stop resuscitation

- Resuscitation should continue until:

~ the baby recovers

~ qualified help arrives and takes over care of the baby

~ an authorised person pronounces that life is extinct

~ the first aider is unable to continue, usually due to exhaustion.

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# Resuscitation in special circumstances

## Resuscitation in water

- If a person falls overboard from a boat or gets into difficulties while swimming, the rescuer or first aider should take special care to avoid injury during any rescue attempt. If the victim is in deep water, only a very strong swimmer who is supported by a good flotation device should attempt rescue and resuscitation.
- Before any resuscitation attempts are made, the victim should be towed to shallow water where the rescuer can stand.

- Once in shallow water the rescuer may commence rescue breathing if trained to do so. The victim's head needs to be supported with your arm around and under the shoulders, keeping the face clear of the water.
- The mouth-to-nose technique is best because it is easier to maintain a good seal while keeping the first aider's face out of water. The victim's mouth should be closed firmly during each ventilation to avoid air escaping.
- As soon as it is possible to move the victim from water, clear and open the airway with the victim on the side, then turn the victim on the back and start CPR if necessary.
- After giving 30 compressions give two rescue breaths as for any other collapsed victim. Continue until victim recovers or help arrives.

## Resuscitation for a victim with a laryngectomy stoma

### Background

A person who has had surgery for cancer of the larynx (voice box) may have lost all or part of the airway section between the throat and lower windpipe. In such cases the victim may have a breathing hole (stoma) in the neck through which breathing occurs. Air will only be heard escaping through the mouth if the victim has had a partial laryngectomy in which there is still some air connection between the throat and the windpipe.

- When giving rescue breathing, if a stoma is present the first aider may not see the chest rise with each breath, although the air seems to enter the mouth and throat efficiently. The first aider may even feel or hear air escaping from the neck region following each breath of rescue breathing. If this occurs when there is a good seal over mouth and nose, the first aider should check the neck for the presence of a stoma.
- If a stoma is found the first aider should give rescue breaths through that hole and watch for the rise and fall of the chest as before. If an inner tube is seen inside the stoma it should be left in place because it is maintaining an open airway.

- All other resuscitation steps are the same as for any adult victim — see **Resuscitation**.

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## Resuscitation using bag-valve-mask equipment

Bag-valve-mask units are designed for use by healthcare professionals, e.g., by doctors, nurses and paramedics. This equipment allows the operator to ventilate the non-breathing person's lungs using a resuscitation face mask attached to a self-inflating breathing bag via a non-rebreathing valve. Oxygen may be added to the reservoir bag for some victims.

Use of this equipment carries risks in untrained or inexperienced hands. If the bag is compressed too hard, excess air will be forced into the victim's stomach, resulting in regurgitation, inhalation of stomach contents and possible death. If the mask does not create a good seal over the victims' mouth and nose, air will leak into the atmosphere instead of into the victim's lungs.

The Australian Resuscitation Council recommends that safe use of this equipment should involve two trained operators: one to maintain an adequate mask seal and the other to compress the bag just enough to cause the victim's chest to rise.

## Resuscitation during the last weeks of pregnancy

### Background

During the final weeks of a pregnancy, or even earlier if a woman is pregnant with twins or triplets, there may be great pressure on the stomach, diaphragm and lungs caused by the growing baby. If collapse occurs at this time there may be complications if standard resuscitation techniques are used. For this reason a modified approach is needed.

- If the pregnant woman is unconscious, she should always be turned on her **left** side to clear and open her airway due to the serious risk of regurgitation from pressure of the baby on her stomach.
- If there are no signs of normal breathing, she should be turned onto her back for CPR but padding is needed under her **right** buttock to tilt her hips slightly to the left. This is known as the Left Lateral Tilt technique and it effectively moves the bulk of the baby off the mother's deep vein on the right side of her abdomen (the inferior vena cava), allowing free movement of blood back to the heart. The angle of tilt is only 15 - 30 degrees.

**If necessary, a bystander may be asked to gently pull the bulging abdomen across to the left side.**

- If CPR is needed, the compressions should be applied as for any other collapsed victim. In a short victim where the shoulders have been raised slightly off the ground by the padding under the right buttock, the first aider should adjust the compression technique to ensure that pressure is directed from the lower half of the sternum straight through to the spinal column. When giving rescue breaths there may be added resistance to each breath because of the bulk of the baby under the diaphragm.
- If CPR is not required, or if the victim recovers after resuscitation has been given, she should be turned into the recovery position but only onto her **left** side.

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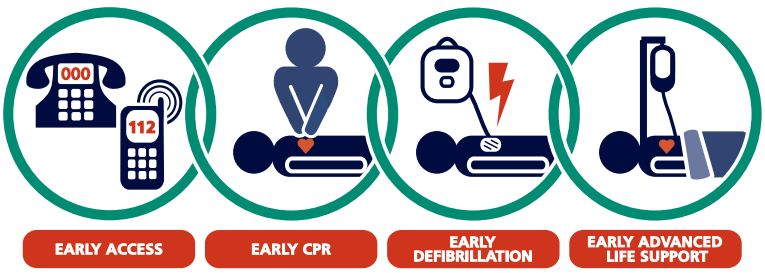
# CPR Summary Chart

| | ADULT older CHILD | CHILD 1 to 18 yrs | BABY up to 1 yr |
|---|---|---|---|
| **CPR ratios for 1 person** | 30 compressions to 2 breaths | 30 compressions to 2 breaths | 30 compressions to 2 puffs |
| **CPR ratios for 2 persons** | 30 compressions to 2 breaths | 30 compressions to 2 breaths | 30 compressions to 2 puffs |
| **Chest pressure** | 2 hands | 1-2 hands | 2 fingers |
| **CPR compression rate** | Approximately 100 per minute | Approximately 100 per minute | Approximately 100 per minute |
| **Compression depth** | One-third of chest depth | One-third of chest depth | One-third of chest depth |
| **Head tilt** | Maximum | Minimum | None |
| **Rescue breaths** | 2 full breaths | 2 small breaths | 2 puffs |
| **Breathing rate** | 1 breath in 1 second | 1 small breath in 1 second | 1 puff in 1 second |

## CHAIN OF SURVIVAL

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# Abdominal injuries

## Background

The abdominal cavity lies below the rib cage and above the pelvic cavity. Unlike the chest and pelvic cavities, there are no bones to protect the abdomen and any injury may cause serious damage to some of the abdominal organs, including the liver, spleen or stomach. In some cases, the injury may involve both the abdominal and pelvic contents. If this occurs, the injured victim may bleed to death internally unless urgent hospital treatment is available.

## Symptoms and signs

- History of injury to the abdominal area
- Bleeding wound or other obvious injury, possibly with visible intestines
- Severe pain and possible muscle spasm across the abdominal wall
- Nausea or vomiting
- Symptoms and signs of shock — see **Shock**
- Bruising of the skin
- Victim unable to stand and holding the injured area for pain relief
- Victim shows other indications of internal bleeding — see **Internal Bleeding**

## What to do — step by step

### 1 Place victim at total rest and assess the injury

- Assist the victim to lie down in a position of greatest comfort, usually on the back or else on the uninjured side, with both knees drawn up for relief of pain and spasm.
- Loosen any tight clothing, especially at waist and neck. Support the victim with pillows and blankets for comfort, as needed. Give frequent reassurance.

- Check the area for signs of injury.

Call 000 or mobile 112 for an ambulance, unless the injury is minor, e.g. winding after a blow to the abdomen.

### 2 Control bleeding and cover any wound

- Hold the wound edges together to control bleeding. Sometimes the victim can change position slightly to help the wound to close.
- If the intestines a e visible, do not touch or try to replace them.
- Cover a gaping wound with sterile dressings soaked in warm water to avoid damage to organs.
- Firmly and gently hold the dressing in place with wide crepe bandages around the trunk, without applying pressure.

**Do not allow the victim to eat, drink or smoke while waiting for the ambulance because an anaesthetic is likely to be needed.**

### 3 Observe the victim

- While waiting for the ambulance to arrive observe the victim for any changes in condition.
- Check the level of consciousness ever few minutes. In the conscious victim an increasing pulse rate is a sign of internal bleeding and urgent medical care is needed.

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# Asthma

## Background

Asthma is a lung condition in which breathing becomes difficult because of inflammation of the air passages. The airways become narrowed by muscle spasm, swelling and increased mucus production, often causing a wheeze to be heard. Air is trapped in the lungs by the swollen airways and the victim has most difficulty breathing out.

A cold, influenza or other chest infection may trigger an asthma attack. The other most common triggers are an allergic reaction to a pollen, dust or animal product, or to exercise, especially in cold weather.

The victim of asthma should be taking prescribed medication to avoid an asthma attack. These drugs are called "Preventers" and are colour-coded in shades of red, brown and gold.

During an asthma attack, the victim can take a prescribed "Reliever" medication, preferably through a "spacer" device, which helps to hold the medication and overcome the difficulty of inhaling it during an attack. Reliever containers are colour-coded in shades of grey or blue, and the medication quickly relaxes airway spasm.

Preventers

Relievers

## Symptoms and signs

- Breathlessness and difficulty speaking more than a few words without a gasp of air
- Wheezing sometimes, but not alway
- Persistent cough, often moist and "rattling"
- Poor skin colour, especially blueness of lips and fingertips
- Obvious breathing effort with pulling-in of the rib spaces
- Rising pulse rate

## What to do — step by step

### 1 Help the victim to rest

- Help the victim into a sitting position, but with support.
- Ideally, allow the arms to rest on a table to increase the rib spaces.

**Do not allow any physical activity.**

### 2 Assist with prescribed medication

- Help the victim to take any prescribed "Reliever" medication as soon as possible. If a spacer is available, the victim should use it to take the medication, one puff at a time.

- Give four separate puffs of the medication with four breaths between each puff and then repeat this dose after four minutes if no improvement has occurred.

**Call 000 or mobile 112 for an ambulance.**

- Continue to assist the victim with four puff every four minutes until an ambulance arrives.
- The puffer must be shaken in between the four breaths for maximum effect.

### 3 Follow-up care

- If improvement occurs, keep the victim at rest until the skin colour is normal. If the victim is a child, ensure that the parents are informed of the attack and advise a medical check with the family doctor.

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# Allergic reaction

## Anaphylactic shock

### Background

Some people are severely allergic to certain foods, chemicals and medications, or to injected venoms following a bite or sting. An allergic reaction can be very severe, and sometimes is fatal within a matter of minutes if prompt medical treatment is not available.

Peanuts in any form are the most common food item that can cause a severe life threatening allergic reaction in a sensitive individual. Many children are severely allergic to peanuts, and parents, child carers and teachers need to ensure that there is no accidental contact through eating a friend's lunch. Others react severely to antibiotics such as penicillin.

These severe allergic reactions are known as anaphylactic shock because the body develops severe shock after the substance enters the body. The reaction may vary from a body rash and slight wheezing, through to collapse and death. For a known allergy a doctor may prescribe some medication to be taken at the first sign of a reaction, usually in the form of a self-administered adrenaline injection through an 'EpiPen' or 'Anapen'.

### Symptoms and signs

- Swelling of the face, especially around the mouth, throat and eyes
- Swelling of the affected area if there has been contact with a chemical or venom
- Redness of the skin or an itchy ash over the chest and back
- Abdominal pain, nausea and/or vomiting
- Breathing difficulty similar to an asthma attack— see **Asthma**
- Dizziness, weakness or collapse

### What to do — step by step

#### 1 Stay with the victim and ensure total rest

- If an allergic reaction is developing, the victim may suddenly collapse and urgent CPR may be needed — see **Resuscitation**.

Call 000 or 112 for an ambulance:

- if the victim is known to have an allergy problem, or
- if the reaction involves any breathing difficulty.

#### 2 Keep the victim at total rest

- Rest can slow down a serious reaction and allow time for help to arrive.
- Help the victim to lie down. If there are breathing difficulties, keep the head and chest raised.

#### 3 Assist with any prescribed medication or treatment

- Some allergic casualties carry prescribed medication in the form of a tablet, puffer spray or even a self-administered injection of adrenaline (EpiPen/Anapen). If necessary, assist the victim to administer their prescribed dose of medication.

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# Allergic reaction



- Hold the EpiPen with a fist grip, remove blue cap and then hold the orange end against the outer thigh and push down HARD. After a click is heard, hold the pen in place for a full 3 seconds before removal.
- If using an Anapen, remove the grey cap and also the black needle cover from the other end of the pen.
- Hold the open end against the outer thigh and press down firmly on the red button. After a click is heard, hold the pen in place for a full 10 seconds before removal.
- Massage the injection site for 10 second to speed up absorption of the medication.

**The EpiPen should not be stabbed into the thigh. When pressed firmly against the outer thigh it will activate automatically.**

**An older child or adult should administer their own EpiPen if possible. A young child may need to be gently restrained on an adult's lap for safety.**

## 4 If the reaction follows exposure to a chemical

- Wash the contact area thoroughly with copious amounts of running water.

## 5 Observe the casualty closely

- While waiting for the ambulance to arrive observe the casualty closely for any change in condition, including:
  - ~ level of consciousness
  - ~ breathing rate
  - ~ pulse rate
- Be prepared to use a second auto-injector if one is available and if the victim deteriorates before the ambulance arrives.
- If the victim also has breathing difficulties, give an asthma "Reliever" puffer through a spacer — see **Asthma.**
- Be prepared to begin resuscitation if necessary — see **Resuscitation**.
- The used pen should be passed to the ambulance crew members for safe disposal.

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# Bites and stings

## Background

Bites are made by an animal jaw or mouth parts, e.g. a dog, spider or snake. An animal uses stinging apparatus combined with the injection of venom, e.g. jellyfish, bee or wasp. In some animals the injury is a combined bite and sting, e.g. Funnel Web spider, Blue-ringed octopus. Even small animals can inject enough venom to kill a baby or small child, e.g. a Funnel Web spider or snake.

Often antivenom may be given to reverse the effects of the poison.

## Symptoms and signs

- Pain (moderate or severe, depending on the animal involved)
- Swelling or deformity of the bite or sting area
- Discolouration of the affected area
- Altered sensation, e.g. numbness or "pins and needles" if a nerve pathway is affected
- Nausea or vomiting
- Headache
- Blurred or double vision
- Muscle weakness or paralysis
- Breathing difficulty

## General management

### 1 Place victim at total rest

- Rest will reduce the effects of shock and also slow down the absorption of venom into the circulation if a venomous animal is involved.
- Give frequent reassurance to lessen the effects of the bite or sting.

Call 000 or mobile 112 for an ambulance.

If in remote area, contact the Royal Flying Doctor Service (RFDS) as soon as possible so that telephone advice or a medical evacuation can be arranged promptly.

## Bites and stings that need special care

### Funnel Web spider bite

All Australian spiders have fangs and venom sacs and are capable of giving a painful bite. However, only the Sydney Funnel Web spider venom poses a threat to life with the rapid onset of breathing difficulties. In and around Sydney and northern New South Wales a bite from any large and dark coloured spider should be treated as a possible Funnel Web spider bite and urgent medical care obtained. If the spider can be safely captured, it can help later identification. Funnel Web spider antivenom is available.

## What to do — step by step

### 1 If bitten on limb apply the Pressure Immobilisation Bandaging Technique

**Pressure Immobilisation Bandaging Technique**

- Select a 5cm elasticised crepe bandage for a small limb, or 7.5cm crepe bandage for a large limb and apply it over the bite site as firmly as for a sprained ankle.

- Apply a second elasticised crepe bandage (5cm or 10cm wide) over the whole limb. Start applying the bandage at the toes or fingertips and work upwards around the limb. Try to cover the limb up to the knee or elbow, and higher if possible.

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### Immobilise the limb

- If bitten on the leg, use the other leg as a splint. Pad between the legs with clothing or a blanket, and tie one leg to the other at the ankles, lower legs and knees.

- If bitten on the arm or hand, apply a splint to the lower arm, and apply an arm sling— see Skills and procedures, **Slings**.
- Once the immobilisation has bee completed, keep the victim quiet and comfortable until an ambulance arrives.
- Once applied, the bandages and splinting should not be removed until the victim reaches hospital or a treatment centre. Check with the victim at intervals to see that the bandages are not too tight. If there is increasing pain in the toes or fingers, it may be necessary to loosen the bandages.

Call 000 or mobile 112 for an ambulance.

- Check regularly that the bandages are not too tight because any movement by the victim to get comfortable may encourage more venom to enter the circulation.

**Keep the bitten limb level with the rest of the body to avoid venom entering the system rapidly. If the bitten limb is lower than the rest of the body swelling is likely to occur.**

**The Pressure Immobilisation Bandaging Technique will slow down the absorption of venom into the circulation, which will allow the lymphatic system to detoxify it — see Lymphatic system.**

## 2 Observe the victim closely

- While waiting for the ambulance to arrive observe the victim closely for any change in condition, including pulse rate, breathing rate and level of consciousness. Be prepared to begin resuscitation if necessary — see **Resuscitation**.

## Snake bite

Some of the most venomous snakes in the world are found in Australia and all are capable of delivering venom that can result in serious illness or even death. Unless you are **certain** the snake is non-venomous, it is always wise to treat any snake bite as venomous. This is vital in a remote area where professional help may be several hours away and the correct first aid can be lifesaving. Antivenom is available for all snake bites in Australia.

### What to do — step by step

## 1 Apply the Pressure Immobilisation Bandaging Technique — see technique.

- Keep the victim lying down at total rest.

Call 000 or mobile 112 for an ambulance.

- Check regularly that the bandages are not too tight because any movement by the victim to get comfortable may encourage more venom to enter the circulation.

**Keep the bitten limb level with the rest of the body to avoid venom rapidly entering the system through gravity. If the bitten limb is lower than the rest of the body, swelling is likely to occur.**

**The Pressure Immobilisation Bandaging Technique will slow down the absorption of venom into the circulation, which will allow the lymphatic system to de-toxify it — see Lymphatic system.**

## 2 Observe the victim closely

- While waiting for the ambulance to arrive observe the victim closely for any change in condition, including pulse rate, breathing rate and level of consciousness. Be prepared to begin resuscitation if necessary — see **Resuscitation**.

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## Other spiders, ant and centipede bites

Other spider bites may cause pain and illness to a baby or small child, but are not a threat to life in normal circumstances. A Red Back spider bite can cause a severe illness to a baby or small child but is not associated with the sudden deterioration of the victim, which occurs with a Funnel Web spider bite.

Recent Australian research has proved that a White-tail spider bite may be very painful but the venom does not cause ulceration of the skin as commonly feared.

### What to do — step by step

#### 1 Apply cold treatment

- Apply a wrapped ice pack for up to 10 minutes at a time, or a cold compress that has been soaked in water to which a few ice cubes have been added. The ice pack should be wrapped in a damp cloth to get the best effect from the ice and to avoid burning the skin. A cold compress should be changed whenever it becomes warm.

#### 2 Elevate a bitten limb

- If the bite is on a limb, aise it to limit swelling. If an arm or hand is involved, apply an Elevation Sling to provide comfort and support — see Skills and procedures, **Slings**.

#### 3 Seek medical advice

Seek prompt medical advice if the victim is a baby or young child, or if the pain becomes severe or the victim becomes ill with a fever, headache, nausea or vomiting.

## Bee or wasp stings

Bees have only one stinging barb that is left in the skin following the incident. The venom sac is attached to the barb and continues to inject venom until it is empty. For this reason the barb should be removed as soon as possible.

The European Wasp does not leave a detached barb in the skin but inflicts multiple stings, thus increasing the amount of venom injected.

The danger with bee and wasp stings is that stings around the mouth, throat or face can swell and cause airway obstruction. Also, some people have an allergic reaction to bee venom and may collapse within two or three minutes after being stung, requiring resuscitation and urgent medical treatment.

### What to do — step by step

#### 1 Remove the barb

- If stung by a bee, quickly brush or scrape the barb off the skin to stop any more venom being injected. Brush the barb off sideways using a fingernail or the side of your hand. Avoid pulling or squeezing the barb, as this will cause more venom to be injected.

#### 2 Apply cold treatment

- Immediately apply a wrapped ice pack to the bite site and leave it in place for up to 10 minutes. Reapply the ice pack for up to 10 minutes at frequent intervals or whenever pain relief is needed.

#### 3 Raise the bitten area

- Raise the bitten a ea as high as possible to limit the swelling that will occur.
- If an arm or hand has been stung, apply an Elevation Sling to provide comfort and support — see Skills and procedures, **Slings**.

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## 4 Seek medical advice

Contact the local doctor for advice. If the victim is known to be allergic to the venom, apply the Pressure Immobilisation Bandaging Technique.

Seek urgent medical assistance and drive the victim to the nearest doctor or hospital before any complications occur.

- Observe the victim closely for any change in condition.
- If any of the warning signs of an allergic reaction appear, send for an ambulance urgently. The warning signs include a fine rash over the trunk, wheezing or coughing, or swelling around the face, eyes and neck— see **Allergic Reaction**.

## Tick bite

Ticks are very small creatures that attach themselves to human or animal skin to feed off blood. The one that attaches to human skin is the Paralysis Tick, which is found on the east coast of Australia from northern Queensland to the eastern Victorian rain forest area. Some ticks are found in other areas of Australia.

A tick is small and very hard to see unless it is full of blood. Most exist in a skin fold or hidden in body hair. A person with a tick may become ill as the tick toxin enters the body. The illness develops over several days and paralysis may occur if the tick is not found at an early stage. The toxin is particularly serious for a baby or small child and people who live in tick infested areas need to be suspicious of tick toxin as the cause of an unexplained illness.

### What to do — step by step

#### 1 Locate the tick

- Look in all the skin folds, body hair and other areas such as behind the ears and in the hairline.
- Seek urgent medical advice and treatment, especially for a baby or small child.

#### 2 If medical care is not readily available

- Apply a wrapped ice pack to the tick to kill it by freezing.
- DON'T try to remove the tick because it is important to inactivate the tick to avoid a serious allergic or anaphylactic reaction.
- Seek medical advice as soon as possible because the tick needs expert removal to ensure that no mouth parts are left in the skin and to manage any allergic reaction.

## Cat or dog bite

Domestic animal bites usually cause an infected wound. Although the wound may be small, medical advice is usually needed, and antibiotics are often prescribed and a protective tetanus injection given.

### What to do — step by step

#### 1 Control any bleeding

- If the wound is bleeding freely, or is on the face, apply a firm pad and hold in place — see **Bleeding**.

Seek urgent medical advice and treatment.

#### 2 Clean a minor wound thoroughly

- Use warm soapy water to remove any harmful organisms.
- If the injury is a deep puncture wound, soak the area in warm soapy water to ensure that the deeper area is cleaned. Harmful tetanus spores can be trapped inside the wound and will multiply when the wound closes over and oxygen is cut off to those tissues.
- Apply a sterile protective dressing.
- Seek medical advice

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# Marine bites and stings

## Marine bites and stings

There are many marine animals that bite or sting and some of them may cause serious illness or even death. The most dangerous marine animals are found in tropical waters, generally considered to be north of Geraldton on the west coast and north of Bundaberg on the east coast of Australia.

The correct first aid can be lifesaving for the victim of a bite or sting from a marine animal off a remote beach in a tropical area.

## Box Jellyfish and Irukandji Jellyfish stings

### What to do — step by step

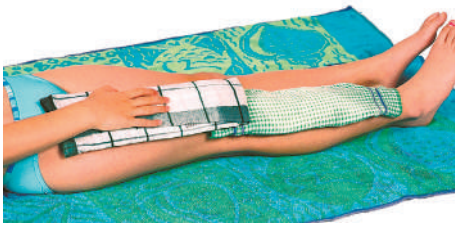
### 1 Douse with vinegar

- Stop the victim from rubbing the stung area.
- Flood all affected areas of skin with household vinegar to prevent further envenomation from unfired stinging cells (nematocysts).

Call 000 or mobile 112 for an ambulance.

### 2 Remove any remaining tentacles

- Pick off any visible tentacles with your fingers. This is quite safe for the first aider.
- Keep the victim lying down at total rest. Any movement by the victim may encourage more venom to enter the circulation.



- Apply vinegar freely over areas that have been stung to neutralise the venom. Rinse the area with sea water (not fresh water) as necessary for pain relief. Reassure the victim frequently and try to maintain a calm approach until an ambulance arrives.

### 3 Observe the victim closely

- While waiting for the ambulance to arrive, observe the victim closely for any change in condition, including pulse rate, breathing rate and level of consciousness. Be prepared to begin resuscitation if necessary — see **Resuscitation**.

**Antivenom is available for the Box jellyfish.**

For specific advice on marine stings in an emergency, call the Australian Venom Research Unit (AVRU) on the 24-hour advice line 03 9483 8204.

## All other jellyfish stings outside tropical waters

### What to do — step by step

### 1 Remove tentacles from the skin

- Stop the victim from rubbing the stung area in an effort to relieve the pain.
- With your fingers pick off any tentacles that have been left on the skin to prevent further stings, then rinse well with sea water.
- Unless it is a minor sting with very little pain, send for ambulance assistance.

**Do not fresh water or other fluids because this can cause firing of the remaining stinging cells in the loose tentacles.**

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## 2 Apply ice packs for pain relief

- While waiting for ambulance assistance apply wrapped ice packs or cold compresses to the stung area.
- If it is a minor sting but pain relief is still needed after 10 to 15 minutes, seek medical or ambulance assistance.

## Blue-ringed octopus bites and Cone Shell stings

The venom of the Blue-ringed octopus and Cone Shell can cause paralysis of the chest muscles used for breathing that may last for up to 48 hours. If prompt resuscitation is given, the victim may survive until the venom wears off.

### What to do — step by step

## 1 Apply the Pressure Immobilisation Bandaging Technique

- Apply the **Pressure Immobilisation Bandaging Technique** immediately with the victim lying down at total rest —see **Technique**.
- Check regularly that the bandages are not too tight because any movement by the victim to ease the pain may encourage more venom to enter the circulation.

Send someone to call 000 or mobile 112 for an ambulance urgently.

## 2 Observe the victim

- Observe the victim closely for any sign of breathing difficulty.
- If normal breathing fails, CPR must be commenced and continued until the arrival of ambulance assistance — see **Resuscitation**.

## Stonefish, Stingray and Bullrout stings

There are several fish that can cause injury by injecting venom through their spines. The stonefish, bullrout and stingray camouflage themselves well and, being adapted to life on the sea floor, inflict injury when a swimmer or someone fishing in the area accidentally steps on the fish. The venom is toxic and generally causes severe pain within a few minutes.

### What to do — step by step

## 1 Immerse the stung area in hot water

- Soak the stung a ea in a container of water hot enough for the first aider to bear on their arm. Hot water can relieve the pain but, if the pain becomes worse with heat, a wrapped ice pack can be tried, although this is rarely necessary.

## 2 Obtain medical assistance

For specific advice on marine stings in an emergency, call the Australian Venom Research Unit (AVRU) on the 24-hour advice line 03 9483 8204.

Antivenom is available for Stonefish stings but needs to be given as soon as possible for the best effect.

**A Stingray may leave the barb in the skin and medical assistance is needed to remove it. The wound left by the Stingray is usually contaminated and likely to become infected. Medical assistance is essential to clean the wound to promote rapid healing.**

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# Bleeding

## External bleeding

### Background

An open wound is any break in the skin. A closed wound is where there is injury to the soft tissues underneath the skin. The amount of bleeding depends on the type and depth of the wound and varies depending on the blood vessels that have been injured.

If an **arter**y has been damaged, bleeding is generally severe with bright red spurts of blood.

If a **vein** has been injured, the blood is usually darker in colour and flows out constantly without any spurting. However, bleeding may be severe and life-threatening if a large vein has been cut, e.g. the jugular vein in the neck.

If a smaller **capillary** is involved following a surface wound, bleeding will vary depending on the location, i.e. bleeding from the scalp often appears severe although the injury may be minor.

### Symptoms and signs

**External bleeding**

- A wound with, or without, an embedded foreign object
- Severe pain from skin surface wounds
- Bruising or discolouration under the skin
- Loss of normal function in the injured area
- Shock — see **Shock**.

**Internal bleeding**

- Rapid and weak pulse
- Rapid and "gasping" breaths
- Increasing thirst
- Signs of internal bleeding with frothy red blood coughed up from the lungs, blood-stained vomit like "coffee grounds", red or rust-coloured urine, or dark faeces like tar.

### What to do — step by step

#### 1 Apply direct pressure to the bleeding wound

- Unless an obvious foreign body is embedded in the wound, use a sterile or clean bulky pad and apply it firmly to the bleeding area with hand pressure. Apply a bandage to keep the dressing in place.
- Encourage the victim to apply pressure to the wound if this is practical.
- The pad should totally cover the wound with a small area of overlap. If no bulky pad is readily available, improvise with clean tissues or light coloured clothing folded into a pad.

#### 2 Raise the injured area

- If the wound is on a limb, raise it in a supported position to reduce blood flow to the injured area. If an arm is injured, apply an Arm Sling or Elevation Sling — see Skills and procedures, **Slings**.

**Try to avoid any direct contact with the victim's blood or other body fluids.**

- If bleeding is severe, do not waste time looking for suitable padding, but be prepared to use your hand to hold the wound together if the victim is unable to do this unaided.
- Although the use of disposable gloves will reduce the risk of cross-infection if bleeding is severe, do not waste time finding and applying gloves while the victim loses more blood.
- If there has been any contact with blood or other body fluids, wash your hands or any blood splashed on the skin thoroughly with soap and water as soon as possible after the incident.
- If you are concerned about a possible risk of infection, ask advice from your doctor as soon as possible.

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# Bleeding

## 3 If a foreign body is embedded in the wound

- Do not remove it but apply padding on either side of the object and build it up to avoid pressure on the foreign body.

- Hold the padding firmly in place with a roller bandage or folded triangular bandage applied in a criss-cross method to avoid pressure on the object.

- If no bandage is readily available, improvise with a sock, scarf or other item of clothing. Use a safety pin or adhesive tape to secure the bandage.

## 4 If the wound is on the head, chest or abdomen

- Place the conscious victim at rest lying down in the position of greatest comfort.
- If possible, ensure that the injured area is higher than the rest of the body — see **Head injury, Chest injury** or **Abdominal injury.**

## 5 Keep the victim at total rest

- Even if the injury involves the arm or upper part of the body, the victim needs to be at total rest for at least 10 minutes to help control the bleeding.
- There will be some degree of shock with any loss of blood and it is important to allow the victim to lie down as soon as possible with both legs raised. This will boost the victim's blood pressure by returning blood to the head and chest areas.

**Call for medical assistance.**

**If the wound appears to be minor and the victim is able to travel by car, arrange an urgent appointment with a local doctor to assess and treat the injury.**

**If the injury is severe or the victim very shocked, call 000 or mobile 112 for an ambulance.**

- An arterial tourniquet or haemostatic dressing may be used if available and special training has been completed.
- Check the victim s level of consciousness, breathing and pulse rate every few minutes while waiting for the ambulance.

## 6 If blood leaks through the pressure pad and bandage

- Apply a second pad over the first **unless the initial pad is full of blood**, which will then reduce the pressure over the wound.

OR

- For major uncontrolled bleeding quickly remove the blood-soaked pad and bandage and replace with a fresh bulky pad and bandage. The continuing bleeding may be due to the pad slipping out of position when the first bandage was applied.

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# Wounds that need special care

## Amputation

### Background

If a shearing force or a sharp object has severed a finger, toe or limb, the correct emergency care may result in the part being successfully being re-attached by a surgeon. It is vital to take great care of the severed part and to transport it to hospital with the victim.

### What to do — step by step

Call 000 or mobile 112 for ambulance transport to hospital.

#### 1 Control any bleeding

- Use a bulky pad and apply it firmly to the raised bleeding area.
- **As a last resort and only when direct pressure has failed,** apply an arterial tourniquet well above the bleeding site. Use a firm, non-conforming bandage, which is at least 5cm wide, around the injured limb, tightly enough to stop all circulation below the tourniquet. Once applied the tourniquet should not be removed and the time of application must be given to the emergency personnel.

**A tourniquet is extremely painful and should be used only as a last resort.**

#### 2 Recover the severed part

- Gently place it into a plastic bag. Seal the bag with a little air inside to protect the severed part with a "cushion" of air.

- Place the inflated bag into a container or bucket of cold water to which several ice cubes have been added.

- Discreetly transport the severed part to hospital by ambulance with the victim.

## Blast injury

### Background

A blast injury is caused by pressure waves following an explosion from gas or a bomb. Occasionally a blast injury occurs in an Australian workplace or when children play with fireworks without realising the potential consequences.

There may be surface bleeding from wounds caused by flying debris, but more serious internal injuries may have occurred. These may be recognised by blood leaking from the nose, ears or mouth, and by the victim coughing up bright red frothy blood from a lung injury, or vomiting dark bloodstained fluid if the stomach or intestines have been injured — see **Internal bleeding**.

A blast injury should be managed as for any other bleeding problem, with pressure and elevation for external wounds, and internal bleeding treated by correct positioning and total rest — see **Internal bleeding**.

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## Crush injury

### Background

A crush injury occurs from compression of large muscle groups and soft tissues by a heavy weight.

The most serious sites for a crush injury to occur are the head, neck, chest, abdomen and thigh.

### What to do — step by step

#### 1 Remove the crushing force

Call 000 or mobile 112 for an ambulance

**Remove the crushing force because permanent tissue damage may occur before the arrival of an ambulance or rescue vehicle.**

**If the crushing force has been in place for some time, be prepared to give prompt first aid, because removal of the crushing force may cause a sudden collapse or deterioration in the victim's condition.**

#### 2 Treat the victim's injuries

- Once the crushing force has been removed, assess and treat any injuries in order of their importance.
- Control any bleeding with a sterile pad applied firmly to the injured area.
- Treat the victim for shock — see **Shock**.
- Assist the victim into the position of greatest comfort and use soft padding to provide support for the injured part.
- If a limb is involved, stabilise an immobilise the injured area — see **Fractures and dislocations**.
- Check the victim's vital signs at frequent intervals and at least every 15 minutes. Note any deterioration or change in the victim's condition and inform the ambulance officers on arrival.

## Nose bleed

### Background

A blow to the nose, flying at high altitude or scuba diving may all cause a bleeding nose.

For a child always check whether there is a foreign body present, e.g. a bead or coin etc.

If this has occurred, seek prompt medical advice and do not try to remove the object yourself because this may cause further damage.

If the bleeding may be due to a head injury, e.g. a fractured skull — see Head injuries. Call 000 or mobile 112 for an ambulance urgently.

### What to do — step by step

#### 1 Apply firm pressure, elevation and rest

- The victim needs to hold the head well forwards and breathe through the mouth while pinching the flaps of the nostrils together for 10 to 15 minutes.
- The victim must be sitting down and a total rest until the bleeding stops.

- If bleeding continues after 20 minutes of pressure, contact the local doctor promptly for advice and treatment.

**Once the bleeding has stopped**

- Advise the victim to avoid blowing or picking the nose because this may restart the bleeding.
- A small child should be encouraged to sit still for up to half an hour to allow the clot to become firm prior to any play activities.

**Bleeding may take longer to stop if it is a very hot day or when a child has been highly active beforehand.**

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## Other wounds

— See also Rules for wound care.

### An abrasion (graze)

An abrasion is a surface wound that affects only the top layer of skin, although it may be very painful because of the number of nerve endings involved. These wounds are often contaminated by dirt or gravel but rarely bleed heavily because only minor blood vessels are involved. Clear serous fluid often weeps from the wound surface and this may continue until some crusting has been formed to seal the wound.

### What to do — step by step

- Gently clean with warm soapy water.
- If there are pieces of gravel embedded in the wound, ask the victim to try to remove them while the area is soaking in soapy water.
- If soaking is impossible, apply warm compresses to clean and soften the tissues.
- Dry the area well by blotting with gauze swabs or a pad of tissues.
- Apply a protective layer of povidone-iodine antiseptic solution and air dry.
- If a protective dressing is necessary, apply a non-adherent sterile dressing and fix it in place with a light roller bandage.

### A high velocity wound

A high velocity wound is caused by a bullet or grease gun. If a firearm is involved there is often a small entry wound and a large exit wound where the missile exploded out of the skin. The missile may have caused serious internal injuries as it passed through the tissues, especially if an organ has been penetrated, e.g. lung, liver or kidney. Bleeding is often severe from the exit wound, which may look like a crater where tissue has been lost.

### A laceration, incised or avulsed wound

A sharp object causes a **laceration**, which may have a jagged appearance. If the injury is deep, e.g. following a stab wound, damage may be caused to nerves and to the muscle and fat layers under the skin and bleeding is often severe.

An **incised wound** is a form of laceration but has straight edges and usually involves only the skin surface. It commonly follows injury with a sharp knife and the bleeding may be severe depending on the number of blood vessels involved.

An **avulsion** occurs when a flap of skin is torn away from its normal position but remains partly attached to the body. If the avulsed part is quickly replaced into its normal position, bleeding is usually only minor.

**All three of these wounds are treated as for any external bleeding** — see **external bleeding**.

### A puncture wound

A sharp or pointed object, such as a piece of glass or a nail, causes a puncture wound. If the foreign object is still embedded in the wound, the bleeding may be only minor because it is being controlled by pressure from the object. The major problem is the risk of infection deep inside the wound, especially tetanus spores, which are anaerobic, meaning that they multiply in an environment that is not exposed to air.

### What to do — step by step

- Clean the wound with warm soapy water to remove any harmful organisms.
- Apply povidone-iodine antiseptic solution and allow it to penetrate the puncture track because tetanus spores may be trapped deep in the wound.
- Allow the wound to dry tho roughly in the air before covering it.
- If a protective dressing is needed, use a porous adhesive dressing and change it daily to keep the wound healthy and dry.

**Contact the local doctor urgently for advice about tetanus immunisation.**

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# Internal bleeding

## Background

Internal bleeding may follow a major blow to the head, chest, abdomen or pelvis, such as in an incident where the victim has fallen from a height or has been struck by a vehicle. There may not be an obvious wound and internal bleeding may be suspected by blood leaving the body in vomit, sputum, urine or faeces and increasing shock — see **Shock**.

## What to do — step by step

### 1 Place the victim at total rest

- Assist the victim into the position of greatest comfort.
- Provide clothing or blankets for support if necessary.
- Cover the victim with a blanket to maintain body heat. Place protective fabric underneath the victim if the surface is rough, cold or hot, e.g. a coat if the victim is lying on a road.

Call 000 or mobile 112 for urgent ambulance transport.

### 2 Observe the victim

- While waiting for the ambulance to arrive manage the injury as required for that body area — see **Head injury, Chest injury,** and **Abdominal injury.**
- Observe the victim closely for an change in condition. If deterioration occurs, the victim may breathe in short gasps (known as "air hunger") to try and obtain more oxygen.
- Ensure that all restrictive clothing has been loosened, especially at the neck and waist. Keep any bystanders well clear to allow the victim to breathe fresh air freely.
- Check the victim s level of consciousness and the breathing and pulse rates every few minutes and note your observations for the ambulance officers. Increasing breathing and pulse rates will indicate continuing bleeding and urgent medical care is required.

**Do not allow the victim to eat, drink or smoke while waiting for the ambulance to arrive because an anaesthetic is likely to be needed.**

## RECOGNITION OF INTERNAL BLEEDING

| BLEEDING SEEN | DESCRIPTION OF BLEEDING | POSSIBLE SOURCE |
|---|---|---|
| Coughed up | Bright red & frothy | Lung or airway |
| Vomited up | Dark red/brown "coffee grounds" | Stomach or intestines |
| From the mouth | Fresh blood | Mouth or jaw injury |
| From the nose | 1. esh blood<br>2. traw-coloured fluid | Nose injury<br>Fractured skull |
| From the ear | 1. esh blood<br>2. traw-coloured fluid | Injury to ear canal or drum<br>Fractured skull |
| From the rectum | 1. esh blood<br>2. Dark, "tarry" faec | Haemorrhoids (piles)<br>Intestines |
| Passed in urine | 1. Dark, blood-stained uri<br>2. esh blood or clots | Kidney<br>Bladder or urethra |
| From the vagina | Heavy bleeding with clots | Menstrual flow or miscarriage |

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# Burns and scalds

## Background

Contact with any source of heat will cause a burn or scald injury. A burn can result from contact with a dry heat source such as hot metal or electricity. A scald is caused by moist heat conact, such as a hot liquid or steam, and clothing over the area may retain the heat and cause further injury. Prompt first aid involves removing the source of heat and thorough cooling of the injured area.

- A **superficial burn** affects only the top layer of skin *(previously called a 1st degree burn)*
- A **partial thickness burn** damages deeper layers of skin *(previously called a 2nd degree burn)*
- A **full thickness burn** damages the skin and deeper tissues, such as muscle *(previously called a 3rd degree burn).*

## Symptoms and signs

- Severe pain (unless the damage is full thickness and nerve endings are burnt)
- Red, peeling or blistered skin (or blackened if caused by electricity)
- Watery fluid weeping from the injured area
- The victim is likely to be shocked, with pale cold and clammy skin, feeling faint and giddy, and complaining of nausea or vomiting
- Swelling of the injured area may appear later

## What to do — step by step

### 1 Cool the injured area

- Immediately cool the affected area for at least 20 minutes using cold running water from a tap or shower.

- Hold the injured area close to the stream of water to avoid further pain.
- If any clothing is wet with hot liquid or affected by a chemical splash, remove it quickly and carefully.

**Avoid injury to yourself and take special care of the victim's face and eyes if a sweater or T-shirt is removed over the head.**

- Remove any tight clothing, watch, rings or jewellery from the injured area because of the risk of swelling.
- Where possible, keep the injured part raised to reduce swelling.
- If cold water is not available, hydrogel products may be used. However, cold water is always the best treatment for a burn.

Call 000 or mobile 112 for an ambulance if the area of the burn or scald is larger than the palm of the victim's hand, because hospital treatment is needed.

### 2 Treat victim for shock

- If the victim is feeling faint or looking shocked and needing to lie down, place the injured part (depending on the location of the burn) in a bowl or bucket of cold water. If the water becomes warm, add some ice cubes to keep it cool but avoid any contact with the burn area.

- Raise both legs on seve al pillows, a rolled blanket or seat of a chair.

### 3 Apply a sterile dressing

- After cooling the injured area for up to 20 minutes, apply a sterile dressing.
- Use a non-adherent dressing or a special burn dressing that contains sterile ointment to soothe the pain and reduce the risk of infection.

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## Burns and scalds

- Do not break blisters or remove peeled skin.
- Do not try to remove any fabric that is stuck to a burn.
- Do not use ice or ice water on the burn area as further burns may result.
- Do not apply creams, ointments, or lotions to any burn injury because infection may occur and complicate the injury.
- Any substance applied to a burn injury may have to be removed later in hospital.

### 4 Apply a light bandage

- Keep the sterile dressing in place with a loosely applied conforming cotton bandage.

- Check the bandage f equently to make sure it is not too tight if swelling occurs.

Avoid using adhesive tape on the skin around the burn because this may cause further tissue damage.

# Burns that need special care

## Extensive burns or scalds

If the injured area is **greater than the size of the victim's palm**, medical assessment and treatment will be needed.

### What to do — step by step

### 1 Cool the injury

- Cool the a ea only briefly because prolonged cooling of a large area of the body can cause hypothermia.

### 2 Cover the injury

- Use a sterile non-adhe ent dressing if available or, if the burnt area is more extensive, use a pillowcase or clean sheet to cover the injury, but avoid any fluffy surface touching the wound.

### 3 Reassure the victim

- Keep the shocked victim lying down with both legs raised.

Call 000 or mobile 112 for an ambulance urgently.

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# Burns and scalds

## Chemical burns

### What to do — step by step

**1 Quickly remove any contaminated clothing**

Avoid contact with any chemical and further injury to the victim.

**2 Cool the injury**

- Flood the burned a ea with copious amounts of water for at least 20 minutes. Check MSDS if available.

**3 If a chemical solution has splashed into the eye**

- Hold the affected eyelids open to ensure water washes thoroughly under the lids to remove any trapped chemical.

Call 000 or mobile 112 for an ambulance urgently.

Certain chemicals and products in the workplace require special treatment to be available as follows:

**Hydrofluoric acid burns:** after flooding the affected area with running cool water, massage calcium gluconate gel into the skin to reduce tissue damage. DO NOT use your fingers but use industrial gloves.

**Phosphorus burns:** remove any loose particles on the skin with tweezers. DO NOT use your fingers. Keep the burned area wet to avoid ignition.

**Bitumen burns:** if a limb or finger is involved, keep flooding the area with water for at least 30 minutes. Split or crack the material as it cools to avoid obstruction.

## Electrical or lightning burns

If an electrical current passes through the body it is usual to find a small entry burn but a large exit burn where the electricity goes to "earth".

### What to do — step by step

**1 Make the area safe**

- After checking that the area is safe and/or disconnecting a low voltage appliance from the power source, check the victim for any burns.

**2 Cool the injury**

- Use cold water on any visible injury. Always seek prompt medical advice however small the burn might appear to be because internal injuries may have occurred.

**3 If struck by lightning**

- If the victim is unconscious, be prepared to begin CPR — see **Resuscitation.**
- If the victim does not need resuscitation, check for any burns, particularly on the soles of the feet.

If an electrical storm is continuing with thunder and lightning, try to find shelter for the victim and yourself and ensure that you are not a high point for another bolt of lightning. Avoid sheltering under a tree unless there is no alternative, and if this is the only option, keep well away from the trunk. Ideally find protection in a vehicle or shed where any further lightning strike will be carried to "earth" in the structure.

**4 Cool the injury**

- Cool any burn until an ambulance arrives.

**5 Seek medical assistance**

Call 000 or mobile 112 for an ambulance urgently. Assessment and treatment in hospital is essential.

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# Burns and scalds

## Inhalation burns involving the mouth or throat

If the victim has been accidentally exposed to fire or heated gases, damage may occur to the mouth and airway. There may be signs of burning around the lips, nose, eyebrows or lashes. A dry cough or hoarse voice is an early sign of airway damage and prompt medical care is essential.

### What to do — step by step

**1 Remove the victim to a safe area**

- If in a closed area, and if safe for the first aider, it is vital to remove the victim to a place free of risk and preferably into fresh air.

**2 Cool the injury**

- If smoke or toxic gases may have been inhaled, including carbon monoxide from a vehicle exhaust, chlorine, ammonia or hydrochloric acid, give the victim sips of cool water but do not give ice.
- If there is any breathing difficulty, allow the victim to find the position of greatest comfort with the head and chest raised.

**After an inhalation incident the victim may suffer from a severe lack of oxygen due to internal damage to the throat, upper airway and lungs. It is important to transfer the victim to hospital as soon as possible because there is a risk of deterioration.**

Call 000 or mobile 112 for an ambulance.

**3 Observe Airway, Breathing, Circulation**

- While waiting for ambulance assistance check the victim every few minutes for any change in condition.
- Observe and note the breathing and pulse rate which will both increase if the victim is deteriorating.
- If there is any change in the level of consciousness, record this promptly.
- If unconsciousness occurs, turn the victim on the side and be ready to give CPR if necessary — see **Resuscitation**.

## Clothing on fire

### What to do — step by step

**1 Extinguish the fire**

- Smother the flames with a non-synthetic coat or blanket and push the victim to the ground to remove oxygen from the burning area.

**Be careful to check that the blanket or coat does not contain synthetic fibres which will melt onto the victim's skin and cause additional burns.**

- The rule is to **STOP, DROP** and **ROLL** the victim for safety before checking for burns and cooling the injury — see Skills and procedures, **Fire**.

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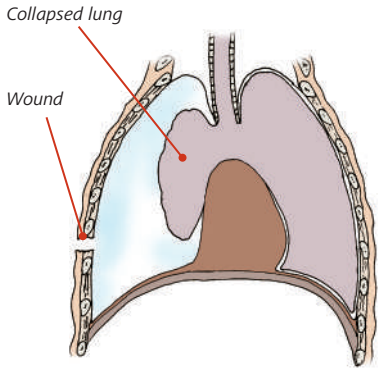
# Chest injuries

## Background

An injury to the chest wall may cause broken ribs and also may damage the two major organs inside the chest, the lung or heart, e.g. a knife wound over the left side of the chest wall. If an open wound is left in the chest wall, air will enter and collapse the lung, causing severe breathing difficulty.

The lung is kept inflated and against the inside of the chest wall by a negative pressure, and once atmospheric air at positive pressure enters through a wound, the lung collapses like a pricked balloon.

Some vehicle accidents may cause severe injury to the chest including multiple rib fractures in which a "flail chest" develops. In this severe condition the two sides of the chest wall move separately and breathing becomes difficult, leading to a lack of oxygen in circulation. The first aider may notice that one side of the chest moves inwards with each breath, whereas the uninjured side moves outwards in a normal breathing pattern.




## Symptoms and signs

- Pain in the chest or back, worse on coughing
- Breathing difficulty, especially breathing in
- Coughing up of frothy, blood-stained fluid
- If a chest wound is present, air bubbling out
- Inc easing shock — see **Shock**.
- Blueness of the lips, inner mouth and finger tips
- Deteriorating level of consciousness
- Abnormal chest movement

## What to do — step by step

### 1 Assist the victim into a comfortable position

- Assist the victim into the position of greatest comfort, generally sitting or half-sitting with support. This upright position will assist breathing and make it less painful for each breath taken in.
- If the injury is to one side of the chest, th victim should lean towards the injured side to avoid blood and other fluids flowing from the injured lung into the uninjured side.
- In an open space, kneel behind the victim to provide support while assessing any injuries.
- Loosen any tight clothing at neck and waist to assist breathing.

### 2 Check for a chest wound and close it

- Check thoroughly, especially if there has been a knife or gun involved.
- If a wound is found, seal it close immediately with your hand, preferably with a bulky pad or piece of clothing as a barrier.

Call 000 or mobile 112 for an ambulance urgently.

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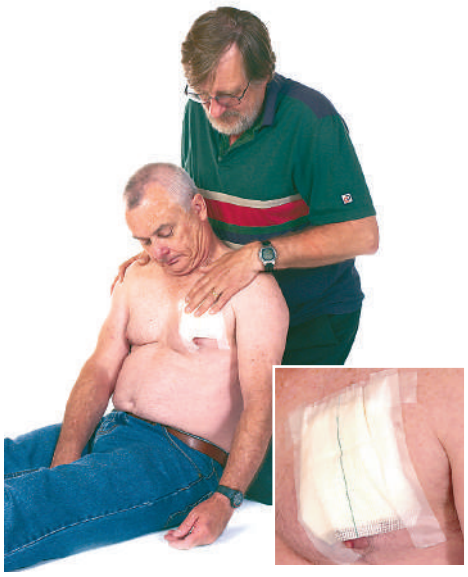
## 3 Apply a sterile or clean dressing over the wound

- As soon as possible seal it on three sides, leaving the lower edge open to allow air under pressure to escape.



**When the lung has collapsed due to the entry of atmospheric air at positive pressure, some air may be blown off through the wound when the uninjured lung moves. It is important that the open edge of the dressing is at the lower edge to act as a vent and to avoid more air being sucked in.**

- The dressing can be covered with a piece of plastic wrap or aluminium foil to make it airtight.
- If a foreign body is still present in the wound, e.g. a knife, do not attempt to remove it because it will be creating an automatic airtight seal. Bulky dressings may be packed around the foreign object to stabilise it — see **Bleeding**.

**Avoid pressure on a foreign object in the wound.**

- If no wound is present, support the chest wall by binding the victim's arm across the chest with a broad bandage.

## 4 Observe victim

- While waiting for ambulance assistance stay with the victim and check every few minutes for any change in condition.
- Observe and note the breathing and pulse rate, which will increase if internal bleeding is present.
- Check for and record any change in the victim's level of consciousness.
- If unconsciousness occurs, turn the victim onto the injured side and check that the airway is clear and open.

- If the victim is not b eathing normally, start CPR — see **Resuscitation**.
- Do not give any food or fluids because an anaesthetic may be needed. If shock is severe or the victim is becoming dehydrated and distressed, moisten the lips with a damp cloth or give ice chips to suck.

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# Childbirth and miscarriage

## Background

Childbirth usually takes several hours. Although in exceptional cases a baby arrives suddenly before it is possible to move the mother to hospital, it is rare for this to happen with a mother's first baby because the birth canal needs to undergo a great deal of stretching and adaptation to allow the baby's head to move down from the womb.

## Symptoms and signs

- Lower abdominal cramp-like pains at regular intervals
- An urge to push down when the baby is ready to be born
- A feeling of excitement mixed with anxiety

## What to do — step by step

### 1 Assist the mother into a suitable position

- Assist her to lie down on a bed, or the floor, if delivery seems to be imminent.
- Place a piece of plastic cove ed by old sheets or towels under the mother to protect the bed or floor.
- Reassure the mother that help is coming and that you will stay with her.

Call 000 or mobile 112 for an ambulance.

### 2 Prepare for the baby's arrival

- Prepare a clean sheet or towel for the baby's arrival and leave it in a warm place nearby.
- If the mother wants to push the baby out with each muscular contraction, ask her to slow down the process by "panting like a dog". This may require you to pant with her to keep the mother from pushing down.
- If the baby is ready to be born, the mother will be unable to pant and will push down hard with each contraction until the baby's head is out of the birth canal.
- Help the mother to rest and relax between contractions.
- Check between the mother's legs after each contraction to see whether the baby's head is visible. If it can be seen, be ready to assist with the baby's birth.

### 3 Assist with delivery of the baby

- As the baby's head moves out, be ready to support the head and check that the umbilical cord is not around the baby's neck. If a loop of cord is seen or felt at the neck, try to ease it over the baby's head for safety. The baby's head will then move forwards with each contraction until it is fully delivered.
- Once the head is free of the birth canal, the baby's head and shoulders will be seen rotating sideways to permit delivery of the baby's trunk and limbs. There is no need to assist in this process but it is important to wipe clean the baby's mouth and nose so that the baby is safe to take its first breath as soon as the body is born.
- With the next contraction, the baby's shoulders, trunk and limbs will slip out of the birth canal and the baby should take its first breath and then cry a little. The baby's colour will then change from a dark blue to a bright pink as the lungs fill with fresh air and oxygen.
- Dry the baby in a warm towel or sheet Place the baby on the mother's abdomen for extra warmth. Place a warm blanket over the mother and baby.

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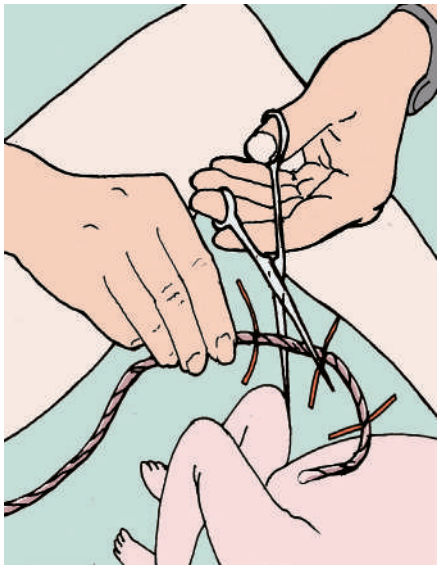
# Childbirth and miscarriage

- Check that the mouth and nose are still clear and that the baby is breathing quietly.
- The umbilical cord and afterbirth will still be inside the mother and the first aider should avoid pulling on the cord at any stage.
- Leave the baby attached to the umbilical cord until the large blood vessels stop pulsating. At this point the baby is breathing and circulating oxygen-rich blood independently of the mother.
- If the ambulance is due, leave the cord attached to the baby until the ambulance crew arrive.
- If there is likely to be a delay in the arrival of the ambulance, prepare to cut the cord. Cut three pieces of clean string into lengths of approximately 20cm each. Tie the first piece approximately 10cm from the baby's navel, and the second 15cm away from the navel. Tie a third piece 20cm away from the baby's navel.
- Use sharp scissors to cut between the second and third ties and sever the cord, leaving two ties in place.



## 4 Assist with delivery of the afterbirth

- Allow the mother to nurse or breast-feed her baby to encourage the womb to contract and deliver the afterbirth.
- If the afterbirth is delivered, place it in a covered container for the doctor or midwife to check later. Sometimes small pieces of afterbirth become dislodged and may be retained in the womb and cause a severe infection.

- Keep the mother lying down at rest until the ambulance arrives.
- Give the mother fluids to drink to replace those lost during the birth process.

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# Childbirth and miscarriage

## Childbirth complications

### Background

There are a number of problems that can occur during childbirth and very little that a first aider can do except stay with the mother and keep her calm until an ambulance arrives.

Sometimes the baby is not positioned correctly for a simple delivery and the baby's hand or foot, face or buttocks may appear in the birth canal before the head is ready to be born. This can cause serious injury to both baby and mother and the first aider needs to reassure the mother until trained help arrives.

Sometimes the placenta starts to pull away from the lining of the womb before the baby is born, causing severe bleeding from the mother, and complications for the baby.

If the baby becomes distressed during the birth process, the heartbeat will increase. This is a serious emergency and requires urgent medical care.

### Symptoms and signs

- Severe lower abdominal pain caused by obstruction of labour
- The appearance of a baby's foot, hand, face or buttocks from the birth canal, instead of the top of the head
- Bleeding from the birth canal
- Greenish/black staining of the fluid draining from the birth canal
- No obvious progress despite strong contractions.

### What to do — step by step

**1 Call urgently for medical assistance**

Call 000 or mobile 112 for an ambulance, or contact a local doctor for help.

- Keep the mother at rest. Reassure her but encourage her to try to stop pushing with each contraction. Ask the mother to pant hard with each contraction to slow the baby's progress down the birth canal.
- If the mother is in severe pain or has lost a quantity of blood, manage her for shock — see **Shock**.
- If the mother is still lying on her back place some padding under her **right** hip and buttock to move the baby off her deep veins and assist with the return of blood to her heart.
- If the mother loses consciousness, place her in the recovery position on her **left** side and be ready to begin CPR —see, **Resuscitation during the last weeks of pregnancy.**

**If resuscitation is required in late pregnancy it is vital to keep the mother tilted to the left to keep the weight of the baby off her deep veins.**

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# Childbirth and miscarriage

## Miscarriage

### Background

If a mother loses her baby before the 20th week of her pregnancy, it is known as a miscarriage. This can be a serious medical emergency due to the degree of shock and sudden blood loss, but also causes an emotional stress for the mother.

### Symptoms and signs

- Heavy vaginal bleeding in a pregnant woman
- Severe cramp-like pains in the lower abdomen
- Pale, cold and clammy skin due to shock — see **Shock**.
- Rapid and weak pulse rate

### What to do — step by step

#### 1 Assist the victim to rest

- Assist the victim to lie down at complete rest in the position of greatest comfort.
- Place a pillow or rolled towel under the knees to ease abdominal pains and spasm.

- Check the bleeding every few minutes an note whether clots are present.

Call 000 or mobile 112 for an ambulance as soon as possible.

#### 2 Observe the victim closely

- Check the victim's breathing and pulse rates every few minutes. Note any increase in the rates because this may indicate severe bleeding.

#### 3 Stay with the victim until the ambulance arrives

- Moisten the victim's lips if they are dry, but avoid giving any food or fluids because an anaesthetic is likely to be needed on arrival in hospital.
- Reassure the victim until the ambulance arrives.

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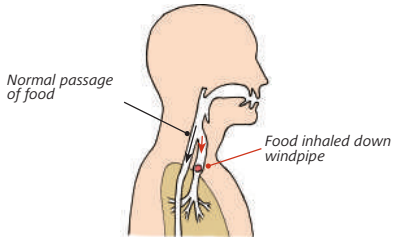
# Choking

## Background

Choking occurs when a person is unable to breathe due to obstruction in the throat or windpipe (trachea). This airway obstruction can be caused by an inhaled foreign body, trauma or internal swelling associated with an anaphylactic reaction. The onset is likely to be sudden when caused by an inhaled foreign body, but more gradual in onset when due to internal swelling.

**Partial (mild) airway obstruction:** the victim will be able to breathe and cough, although there may be a "crowing noise" (stridor) as air passes through a narrowed space. Usually the victim can clear a small foreign body by coughing and, although the breathing may be noisy, air can still enter and leave the lungs. At this stage it is important to avoid giving backblows which may cause a foreign body to move and become a total obstruction.

**Total (severe) airway obstruction:** the airway is completely blocked and no air can move up or down the windpipe into the lungs. The victim cannot cough effectively and may die of a total obstruction unless prompt first aid is given.




## Symptoms and signs

**Partial (mild) airway obstruction:**

- Breathing laboured, gasping or noisy
- Some air escaping f om the mouth
- Victim coughing or making a "crowing noise"
- Extreme anxiety or agitation

**Total (severe) airway obstruction:**

- Victim unable to effectively cough, breathe or speak, with no air movement
- Victim making obvious efforts to breath with in-drawing of spaces between the ribs and above the collar bones
- Victim's face is greyish in colour with blue (cyanosed) lips due to lack of oxygen
- Victim clutching the th oat with both hands (universal choking sign)

## Partial (mild) airway obstruction

### What to do — step by step

Never use back blows on a person who is able to cough effectively or breathe.

### 1 Reassure and encourage the victim

- Stay with the victim until full recovery has occurred.
- Encourage the victim to cough and expel the foreign body.

If the obstruction is not relieved, call 000 or mobile 112 for an ambulance.

## Total (severe) airway obstruction

### What to do — step by step

Call 000 or mobile 112 for an ambulance.

### 1 If the victim is conscious, give up to five back blows

- With an adult or child standing or sitting, and using the heel of one hand, give up to five back blows between the victim's shoulder blades.
- Place a baby face down across your lap for the back blows.

The back blows are given separately with a check after each one to see if the obstruction has been relieved.

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# Choking

**2 If unsuccessful, give up to five chest thrusts.**

- With an adult or child standing or sitting place one hand over the lower half of the breastbone (sternum) as for CPR, and the other hand over the spine at the same level. Give up to five sharp chest thrusts at a slower rate than for CPR.

- Place a baby face upwards across your lap and give up to five sharp chest thrusts as for CPR, but at a slower rate.

**The chest thrusts are given separately with a check after each one to see if the obstruction has been relieved.**

**3 If the obstruction has not been relieved, continue by alternating back blows and chest thrusts until the ambulance arrives.**

## Unconscious

### What to do — step by step

Call 000 or mobile 112 for an ambulance.

**1 If the victim is unconscious**

- Quickly check the mouth and use you fingers to remove any visible solid obstruction.

**2 Begin CPR**

- If there is no normal breathing give 30 compressions at the rate of approximately 100 compressions per minute, alternating with two rescue breaths.

**There may be some resistance to inflations at first until the object has been dislodged.**

- Continue CPR until the ambulance arrives — see Resuscitation..

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# Cold illness

## Hypothermia

### Background

**Hypothermia** is a serious medical condition that occurs following exposure to extreme cold. Exposure to cold conditions can be made more serious if the victim's clothes are wet, especially in a cold wind. In serious hypothermia, as internal organs cool, the victim's level of consciousness will deteriorate and, unless prompt medical care is available, death may occur.

Accidental hypothermia also can affect an elderly or very young person wearing inadequate clothing in cold conditions or living in an unheated room, especially when malnutrition is present.

**Frostbite** occurs when one part of the body is exposed to extreme cold and usually involves an extremity. Most commonly this affects the fingers or toes, but frostbite may involve the nose or ears if the head is uncovered in freezing conditions.

### Symptoms and signs

- Shivering in the early stages of hypothermia
- Apathy and confusion
- Poor coordination
- Exhaustion and disorientation
- Slowing pulse rate, often irregular beats
- Collapse and unconsciousness in late stage

### What to do — step by step

#### 1 Shelter the victim

- Either find a solid shelter nearby or improvise a windbreak and rain protection.
- If the shelter is adequate, assist the victim to remove all wet and cold clothing and replace with dry articles.
- If no shelter is available, wrap warm clothing or a blanket around the victim over the wet clothes.

**Do not remove cold, wet clothing in exposed conditions because this may cause a further drop in body temperature.**

#### 2 Rewarm the victim

- Help the victim to rest lying down in a sleeping bag if available.
- Ensure that there is protection underneath the body to avoid losing more body heat into the ground.
- Cover the victim with a blanket, dry clothing, bubble wrap or an aluminium foil rescue blanket, to maintain body heat. Use body-to-body contact if necessary.
- Give a conscious victim **warm** sweet drinks with added glucose, or biscuits and similar energy foods at regular intervals.

**Avoid hot drinks or alcohol because this will divert blood to the stomach and away from the cold body parts.**

#### 3 Obtain medical help

Use a mobile phone to call for an ambulance on 112. Otherwise send someone to call for help at the nearest township or main road.

- Stay with the victim and note the level of consciousness, breathing and pulse rate at 10 to 15 minute intervals until help arrives.
- If the victim becomes unconscious, place in the recovery position and be prepared to begin CPR if necessary — see **Resuscitation**.

**If cardiopulmonary resuscitation (CPR) is necessary, continue for as long as possible or until help arrives, because recovery may be very slow if hypothermia is present. A full recovery is unlikely until the body temperature rises, but the victim may recover later in hospital.**

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## Frostbite

### Symptoms and signs

- White and waxy skin
- Tingling at first, then loss of sensation in th affected part
- Altered skin colour from pink initially, to blue, then yellow or white later
- Affected skin surface is colder than the rest of the area

### What to do — step by step

#### 1 Protect the victim

- Avoid further exposure to the cold source.
- Remove any item that may be affected by later swelling, e.g. wristwatch, ring or other jewellery.

#### 2 Gently rewarm the part

- Use body heat to rewarm, e.g. ask the victim to place the fingers in the opposite armpit, or cover the nose, chin or ears with gloved hands.
- If **warm** water is available, place the affected fingers or toes in warm water until the victim feels tingling.

- Pat dry the fingers or toes using gentle movements.

**Do not use direct heat or massage to rewarm the victim, e.g. a blow heater or hot packs, because these will take heat to the skin surface and cause severe pain and possible tissue damage.**

#### 3 Protect the affected area

- Apply sterile, soft dressings between the affected fingers or toes.

- Then apply soft padding and a protective bandage to the whole area.

- For other body parts, protect the tissues with soft padding.
- Raise the affected part to educe pain and swelling. If the fingers are affected, apply an elevation sling — see Skills and procedures, **Slings**.

#### 4 Obtain medical advice

**Contact the local doctor or attend the nearest hospital Accident and Emergency Department for advice and treatment.**

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# Convulsions and seizures

## Background

A **convulsion** occurs only in early childhood when a child under the age of six years has a high fever caused by a severe infection.

A **seizure** can occur at any age and is due to abnormal electrical activity in the brain resulting in uncontrollable muscular activity and loss of consciousness. There are many types of seizure with some being relatively mild and others severe and prolonged. The term "fit" is no longer recommended for use when referring to an epileptic seizure, because the condition is a recognised illness.

One mild form of epileptic seizure is known as petit mal or absence seizure: the victim stops suddenly and stares into space without any awareness of the surrounding environment or dangers. After a few seconds the victim suddenly recovers and continues the interrupted activity as if nothing unusual had occurred. A full-scale epileptic seizure involves violent jerking of the limbs, facial twitching and foaming at the mouth due to saliva being blown through clenched teeth. The seizure may last for one or two minutes and the victim may need several hours in which to recover.

If a person with any form of epilepsy wants to take part in swimming or other water activities, it is vital to be accompanied by a person who is competent to recognise the early warning signs of a seizure and to carry out a prompt rescue if necessary. Generally it is safe for the victim to remain in water during the seizure, provided that someone is supporting the head and shoulders above the water. Removing a person from water during a seizure is dangerous for both the victim and rescuer, but easier and safer to perform once the convulsive stage has ended.

## Symptoms and signs

- Jerking or twitching of the face and limb
- Foaming at the mouth
- Loss of consciousness
- Loss of control of bladder and/or bowel
- Blue/purple skin colour and blue lip
- Flushed and dry skin in a child having a feverish convulsion

## What to do — step by step

### 1 Protect the victim from injury

- Check the immediate area for hazards and remove them if possible. Move furniture away from the person but take special care with electrical appliances or cooking utensils to avoid a burn or scald.
- If the victim is close to a wall or hard furniture, pad the area with clothing or a pillow to avoid further injury.

**Do not move or try to restrain the victim's movements because this may result in a broken bone or soft tissue injury. Do not try to pad between the victim's teeth because this may damage the tissues in the mouth.**

### 2 Manage the seizure or convulsion

- Stay with the victim until the seizure ends.
- If in a public place, keep bystanders clear and reassure them that the seizure will end soon.
- Loosen any tight clothing at the victim's neck and waist, but be aware of the risks of personal injury from flailing limbs.

**Avoid giving anything to eat or drink until the victim is fully conscious.**

- Wait for the seizure to finish before attempting any other care of the victim.

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# Convulsions and seizures

## 3 After the seizure

- As soon as the jerking ends, quickly roll the unconscious victim onto the side and clear and open the airway.

- Cover the victim lightly with a coat or blanket in case there is incontinence due to loss of bladder or bowel control.
- Check that normal breathing has resumed.
- Allow the victim to sleep until full recovered, but check for a response every few minutes.

If the victim does not respond, call 000 or mobile 112 for an ambulance urgently.

## 4 After care

- Check for a Medic Alert pendant or bracelet stating that the wearer suffers from epilepsy.
- Check for any injuries and t eat a bleeding wound promptly — see **Bleeding**.
- Reassure the victim as full consciousness is restored.
- Advise the victim not to drive. Try to arrange for someone to be with the victim until safely home.
- Advise the victim to contact the doctor to report the seizure and check that any prescribed medication is adequate.
- If the victim is known to have epilepsy, there is no need for medical aid or an ambulance unless the seizure lasted more than five minutes or a second seizure followed. If it is the first known seizure, medical advice is vital to avoid any future complications.
- If the victim is a child, is known to have diabetes or is obviously pregnant, an ambulance should be called promptly because of the risk of complications.

## Special care for a feverish convulsion in a child

### What to do — step by step

**1 Ensure the child's safety from any hazards**

**2 Remove all clothing down to a nappy or pants to allow the skin to cool naturally**

**3 Wait until the convulsion ends before rolling the child or baby onto the side**

**4 Clear and open the airway and check that normal breathing has returned**

Contact the local doctor for advice as soon as possible and before the temperature goes up again.

- You may be advised to give some medication to control the temperature and avoid another convulsion.

**Avoid giving anything to drink until the child is fully conscious.**

**Do not cool the child by artificial means such as fanning or a cold bath because this can cause complications later.**

**Allow the temperature to fall by natural means and obtain medical advice as soon as possible to diagnose the problem and prescribe treatment.**

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# Croup

## Background

Croup is usually the result of a viral infection. It affects babies and young children and rarely occurs after the age of five years.

Croup is a form of obstructive breathing in which the larynx (voice box) is narrowed by swelling as a result of an upper respiratory tract infection. In severe cases the airway may close over totally so that medical advice is important at the first signs of the illness. It often follows an upper respiratory tract infection such as a heavy cold or tonsillitis.

Another severe form of croup is epiglottitis (inflammation of the epiglottis just above the larynx), which is generally caused by a bacterial infection. This condition may also lead to total airway obstruction and generally requires a stay in hospital under close supervision until the child starts to recover.

Croup is usually worse at night and generally lasts three to four days. On some days the child may seem to be fully recovered, only to deteriorate again in the evening.

## Symptoms and signs

- Noisy breathing with a high-pitched sound, (called stridor), especially when breathing in
- A harsh, barking cough followed by a period of breathlessness
- Bluish colouration of the lips, ear lobes and fingertips
- Visible breathing effort with drawing-in of the ribs when breathing in
- Use of the muscles in the neck to assist with breathing
- Anxiety and distress

## What to do — step by step

### 1 Relieve the breathing difficulty

- Reassure and keep the child calm. Ensure that warm clothing is being worn.
- Close all windows and doors to reduce draughts.
- If the child is feverish with a temperature of more than 38°C, or complains of a sore throat, give one dose of paracetamol. Strictly follow the dosage instructions on the bottle and, if the child does not improve, check with your doctor before giving a further dose.

### 2 Obtain medical advice and care

- Even though the child may seem to be better, contact the local doctor for advice on further treatment.
- Ensure that the child stays at rest in a warm room.
- Give frequent drinks of clear fluids, e.g. cordials, to avoid dehydration from the effort of breathing and having a high temperature.

**If the child does not improve, obtain prompt medical advice or call 000 or mobile 112 for an ambulance.**

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# Diabetes

## Background

Diabetes is a medical condition in which there is a failure of insulin production in the pancreas. The result is a failure to process carbohydrates, fats and proteins correctly and the victim loses weight, becomes very thirsty and passes large quantities of urine.

The victim of diabetes is usually treated with a modified diet or daily insulin injections. However, if the correct diet is not followed, or if a severe infection occurs, this can lead to an insulin coma from **too little sugar** in circulation **(hypoglycaemia)**. Unless prompt first aid with sugar plus follow-up medical care is available, death may occur.

The reverse condition of **hyperglycaemia** occurs when the victim lapses into a diabetic coma from **too much sugar** in the body. However, this condition is not as common as hypoglycaemia and has a very slow onset. Because it is a less serious condition, sugar is still given because of the risk of the condition being hypoglycaemia which could result in collapse and death before medical care is available.

## Symptoms and signs

- Extreme tiredness and loss of concentration
- Severe thirst
- Abdominal pain
- Nausea or vomiting
- Dizziness and loss of coordination
- Eratic or argumentative behaviour
- Rapid loss of consciousness if not treated promptly
- Persistent headache
- Flushed or pale face
- Sunken eyes and parched lips

## What to do — step by step

### 1 Give the victim some sugar

- If the victim is still fully conscious and able to swallow, give a sweet drink, glucose gel or glucose sweets to suck.
- If the victim is able to cooperate and swallow safely, an improvement usually occurs within minutes.
- When the victim is more alert, offer a more substantial carbohydrate meal of a sandwich or several sweet biscuits.
- If a blood glucometer is available an either the victim or a trained first aider knows how to use it, this will give an accurate blood glucose reading.

**Remember that because the symptoms and signs of too much sugar and too little sugar are very similar, it is always best to assume that a low blood sugar is present (hypoglycaemia), as this is the more serious condition. If there is already too much sugar in the body, a sweet drink and sandwich will make very little difference to the victim.**

### 2 Obtain medical advice

- If the victim has improved with the intake of carbohydrate, medical advice is still necessary because a further deterioration may occur at any time. You may be advised to take the victim to a local doctor, or to a diabetic clinic in a hospital, depending on circumstances.

**If the victim does not improve after swallowing the sweet food or drink, or if further deterioration occurs and swallowing becomes difficult or impossible, call 000 or mobile 112 for an ambulance.**

- While waiting for the ambulance to arrive check and record the level of consciousness and note the breathing and pulse rates.

**Do not try to give the victim a dose of insulin because this can be dangerous unless a medical assessment has been carried out and the victim's blood sugar level tested.**

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# Drug and alcohol overdose

## Background

Almost any drug taken in excess can cause a person to suffer the effects of an overdose. Some prescribed medicines and recreational drugs taken in excess or without medical supervision can prove fatal unless prompt emergency care is available.

The effects of any drug will vary depending on the nature of the substance, the age, weight and general health of the victim, and whether any alcohol was consumed at the same time.

Many young people are exposed to the risks of taking a "recreational drug" at a party or entertainment venue, often without knowing the nature of the substance concerned. Sometimes a cocktail of drugs may be taken in the hope of enjoying a "high", but this can prove to be a fatal step and seriously complicates the medical treatment required. Such recreational drugs include a range of stimulants, including 'ecstasy', amphetamines ('speed'), and cocaine etc. Depressant drugs may also be abused and include various narcotics and barbiturates. Hallucinogenic drugs that may be taken include marijuana, "magic mushrooms" or LSD. The first aider will be unable to give any specific treatment for the victim of drug abuse and can only give care following the normal priorities of basic life support — see the **Basic Life Support Flow Chart**.

Alcohol taken in excess, as in "binge drinking", can have a serious effect on the body. In the early stages the victim may be unaware of hazards, with loss of coordination, and is at risk of injury. Later the victim is likely to become unconscious and needs close supervision and airway care to avoid airway obstruction and possible death.

## Symptoms and signs

- Drowsiness, loss of coordination and collapse
- Rapid and weak pulse
- Confusion or hallucination
- Altered breathing pattern or breathing difficulty
- Mood changes including excitability, aggression or depression
- Pale, cold and clammy skin
- Nausea or vomiting
- Seizures
- Abdominal pain

## What to do — step by step

**Avoid contact with any of the victim's body fluids including blood, saliva, vomit or urine. Look around carefully for a syringe, needle or other sharp object that might penetrate the skin.**

**If there is any contact with the victim's body fluids during the first aid treatment, wash all contaminated skin surfaces thoroughly with soap and water. Dry the skin well and contact your doctor for further advice about protection from any infectious diseases.**

### 1 Assess the victim

- Check the level of consciousness. If the person is not fully conscious and alert, try to turn the victim onto the side into the recovery position — see **Resuscitation**.

Call 000 or mobile 112 for an ambulance.

- Be ready for an unexpected move by the victim and avoid putting yourself and others at risk of a punch or blow by staying too close.

### 2 Reassure the victim

- Talk to the victim in a quiet and reassuring manner.

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# Drug and alcohol overdose

## 3 Identify the drug taken

- Ask what the victim has taken and whether it was swallowed, inhaled or injected —see **Poisoning**.
- Look for evidence that might assist the hospital staff with treatment and keep any container, syringe or needle and any vomit to aid analysis and identification.
- Maintain body heat with a coat or blanket to avoid heat loss. In cold weather in the outdoors environment, place fabric under the victim if possible to reduce heat loss from lying on a cold surface.

**Some drugs create serious overheating of the body and if this is noticed, remove unnecessary clothing to allow air to reach the skin surface to assist with cooling.**

## 4 Give emergency care

- Keep talking to the victim to monitor the level of consciousness and note any changes, especially any deterioration
- Frequently check that the airway is clear and note the breathing and pulse rates.

## Needle stick injury

The risk of catching any disease from contact with a discarded syringe needle is extremely low; however, it is advisable to take care whenever you pick up a used needle.

## 1 If you find a syringe with a needle

- Obtain a strong plastic or glass screw top container, such as one used for fruit juice or jams. Take the container to the syringe and needle.
- Pick up the syringe by the barrel, holding it at the end furthest away from the needle. If the needle and syringe have been separated, do not attempt to replace the needle on the syringe, or replace any cap on the needle.
- Drop the syringe and needle into the chosen container and seal the top securely. Mark the outside as 'Hazardous Waste' and arrange disposal through your local doctor, hospital or council.

## 2 If you injure yourself with a needle

- Wash the injured area thoroughly with soap and warm water.
- Apply an antiseptic in accordance with the directions on the label.
- When the a ea is dry, apply a sterile adhesive dressing.
- Obtain further advice f om your local doctor as soon as possible, and within 24 hours of the injury.

## Accidental overdose of drugs

For first aid management of an accidental overdose of medicines or drugs — see **Ingested poisons.**

Many medicines have lifesaving properties but, if taken in excess, some can cause serious illness or even death. If a small child takes medicines that have been prescribed for an adult, even a small dose may lead to unconsciousness and death.

All medicines should be kept in a safe area out of the reach of children. Wherever possible medicines should be kept in a locked cupboard with the exception of those that need to be kept in a refrigerator. In this situation it is possible for a child to reach the medication and it is wise to request the pharmacist to provide a childproof container if possible.

If a medicine is taken only on an occasional basis, be sure to check the expiry date and obtain a new prescription before the medication is out of date.

Clean out all medicines at least once a year and return unused or expired doses to the pharmacist for safe disposal or for use in overseas aid.

If a person is taking a large number of medicines at different times of the day it may be advisable to use a Dosett in which doses for the coming week are pre-sorted according to the times of day required.

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# Eye injuries

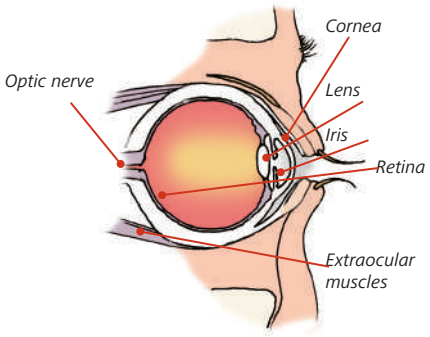
## Background

The eye is a delicate structure that is easily damaged by a small foreign body. If a foreign body scratches or scars the eye surface, the victim may lose some or all vision in the injured eye.

A heavy blow may injure soft issues and bone around the eye. This can result in pressure on the eyeball and cause blurred or double vision, or even blindness.

In a workplace where welding is undertaken a painful flash injury may occur unless personal protective equipment is used correctly.

A chemical splash in the eye can cause permanent loss of vision and needs prompt first aid and medical care.




## Symptoms and signs

- Pain in, or behind, the eye
- Spasm of the eyelid
- A continuous flow of tears f om one eye
- Reduced or altered vision, or even loss of sight
- Blood visible in the eye, or bleeding around the eye

## Major eye conditions

### What to do — step by step

### 1 Rest and reassure the victim

- For a serious eye injury, help the victim to rest in the position of greatest comfort with the injured eye closed.

- Keep the head slightly raised above the level of the shoulders to reduce any internal bleeding.
- Advise the victim to avoid all movement of the head to prevent further eye damage.
- Reassure the victim that expert help will be obtained and that the injury may not be as serious as it appears to be.

### 2 Protect the injured eye

- Cover the injured eye with a sterile eye pad or sterile wound dressing. If there is a large foreign body lodged in the eye, do not attempt to remove it, but pad around the eye socket to avoid pressure when the dressing is applied.

**It is no longer recommended to cover both eyes.**

- Fix the eye pad or dressing in place with several strips of adhesive tape or with several turns of a **loosely applied** conforming cotton bandage around the head.

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# Eye injuries

- Advise the victim to keep the uninjured eye closed to reduce the risk of movement of the injured eye.

## 3 Arrange for medical care

Once the eye is covered, call 000 or mobile 112 for an ambulance because medical care in hospital is needed.

- Continue to give reassurance and encouragement to the victim.
- While waiting for the ambulance to arrive check the victim for any other injuries, particularly if a blow or fall was involved.
- Check the level of consciousness an ensure that the airway is clear. Remember that an injury around the eye may be associated with concussion or other head injury — see **Head injuries.**

## Minor eye conditions

### What to do — step by step

## 1 Removal of a foreign body

- Check whether the foreign material is visible on the white part of the eye.
- Ask the victim to blink several times to try to remove the foreign body by washing it out with tears.
- If it can be seen, it may be able to be removed by gently using the **soft** corner of a moistened tissue. Make one attempt only.

**If the object is not removed with one attempt, do not continue because of the risk of scratching the eye surface and causing scarring.**

**If the foreign object cannot be seen clearly or is over the coloured part of the eye, do not try to remove it but manage the victim as for a serious eye injury.**

## 2 If unsuccessful, the foreign body may be removed by gentle flushing of the affected eye

- Use a clean jug filled with water and pour a stream of fluid across the injured eye and into a bowl or hand basin. Pour the fluid from the nose end of the eye to the outer corner to avoid accidentally flushing the uninjured eye.

If unsuccessful, cover the eye with a sterile pad and seek advice from the local doctor.

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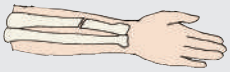
# Fractures and dislocations

## Background

When a bone breaks, it is called a **fracture**. Some fractures are complete, e.g. when a long bone snaps in half, whereas other fractures may involve only part of a bone breaking, e.g. the "greenstick" fracture of childhood.

A fracture is called:

- **closed** where there is no break in the skin.



- **open** where the bone end has broken the skin or a wound is present with the fracture.

- **complicated** where an underlying organ is involved, e.g. a fractured skull with pressure on the brain, or when a broken rib has injured the lung.

A **dislocation** is where a bone has been displaced from its normal position at a joint. Some joints are more likely than others to dislocate under a sudden force, e.g. the shoulder or a finger. As a general rule, a dislocation should be managed as a fracture.

Any injury that might involve either a fracture or dislocation should be treated with great caution. All movement of the part should be discouraged and first aid confined to providing soft padding and support in the **position chosen by the victim.** In a remote area, or where ambulance or medical care is likely to be delayed for an hour or more, the trained first aider may use simple immobilisation techniques to reduce pain and spasm. In such cases, it is the first aider's responsibility to monitor the circulation in any affected limb to ensure that the immobilisation has not compromised blood flow or the nerve supply to an extremity.

## Symptoms and signs

- Pain (severe or moderate, depending on the location of the injury)
- Swelling
- Deformity of the injured area (when compared with the uninjured side of the body)
- Loss of normal function of the injured part
- Discolouration of the skin or bruising
- A wound if it is an open fracture
- Symptoms and signs of shock — see Shock.
- Altered sensation, e.g. "pins and needles" if a nerve is under pressure, or a grating sensation if injured bone ends are rubbing together.

## What to do — step by step

### 1 Control any bleeding

- If a wound is present, check for any bleeding. If bleeding is present it may not be severe because of pressure on nearby blood vessels from the displaced bone and soft tissues.
- Apply padding around the wound, or above and below the wound.

**Do not apply direct pressure over the wound.**

- Apply a sterile dressing loosely over the injured area and bandage it in place, but avoid any direct pressure on the wound or broken bone.

Call 000 or mobile 112 for an ambulance.

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## 2 Immobilise the injured part

- Reduce the pain and the risk of further injury by supporting and immobilising the injured area.

- Effective immobilisation requires an injured body part to be splinted against an uninjured body part, although this may not be necessary if an ambulance is likely to be readily available.

## 3 Make the victim comfortable

- Help the victim into the position of greatest comfort without any unnecessary movement. Use blankets, pillows or clothing for general comfort and support.
- Place generous padding around the injured area and in the nearby hollows of the body, using soft towels, clothing, pillows or blankets, etc.
- If outside the metropolitan area where an ambulance may not arrive within an hour, and if trained to do so, apply padding and/or splinting to stabilise and immobilise the injured part — see **next section.**

**Do not move the victim or any injured part unnecessarily.**

## 4 Treat to reduce shock

- Keep the victim at total rest in a position of greatest comfort.
- Loosen any tight clothing, but maintain body heat.
- Give frequent reassurance.

**Do not give any food or fluids to drink because an anaesthetic may be needed.**

# Fractures and dislocations that need special care

## Fracture of the face or jaw

Although there is little that a first aider can do, fractures of the face and jaw have the potential to be serious and need urgent medical assessment. Injuries to the face, e.g. from a punch, or a blow from a squash racquet, may involve damage to the bones of the cheek, forehead or bony orbit. These may be associated with a head injury or with a serious eye injury which could lead to a permanent loss of sight.

A fractured or dislocated jaw may cause a risk of serious airway complications because of the loss of the ability to swallow.

- If unconscious but breathing normally, place the victim on the side in the recovery position, with the injured side downwards to assist with drainage of fluids from the mouth.

Call 000 or mobile 112 for an ambulance.

- Ensure a clear airway until the ambulance arrives. Check for normal breathing every few minutes.
- If conscious, allow the victim to rest in the position of greatest comfort, generally half-sitting or lying down with the head tilted to the injured side. Provide a clean pad or some tissues for the victim to mop up any blood, saliva or mucus.
- If the jaw appears broken or dislocated, allow the victim to support the injured part with one or both hands.

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## Fracture of the collarbone or dislocation of the shoulder joint

A dislocated shoulder and fractured collarbone are managed in a similar way because both injuries disrupt the shoulder joint, and the weight of the arm on the injured side needs to be supported. Usually the victim will be supporting the arm on the injured side and the shoulder will be lower than the uninjured side, with the victim's head tilted towards the injury. The victim is usually in severe pain and any unnecessary movement should be avoided.

- Use a pillow or folded clothing to allow the victim to support the weight of the arm in the most comfortable position.

- Check the pulse at the wrist every 10 minutes to ensure that the circulation is satisfactory. If the pulse cannot be found, ask the victim to change position slightly until the pulse is felt.

Call 000 or mobile 112 for an ambulance.

- Obtain prompt medical assessment because of the risk of damage to blood vessels and nerves in the shoulder and upper arm areas.
- If ambulance trnsport is likely to be delayed, carefully immobilise the arm with padding under the armpit and apply either an Elevation Sling or an Arm Sling depending on the victim's preferred position — see Skills and Procedures, **Slings**.

## Fracture of the ribs

The injury may involve a single broken rib or several broken ribs. A rib fracture is always associated with pain, especially when breathing in or coughing. Sometimes an abnormal movement can be seen where one part of the chest moves outwards when the corresponding part on the opposite side moves inwards, called a "flail chest". In a severe injury where the underlying lung has been damaged, the victim may have breathing difficulties or cough up blood — see **Chest injuries**.

- Assist the victim into a position of greatest comfort, usually half-sitting with support.

Call 000 or mobile 112 for an ambulance.

- If severe pain or a "flail chest" is present, the first aider should apply improvised padding over the injured area and a broad-fold triangular bandage as a binder to secure the arm to the chest wall over the padding. This will stabilise the moving segment of the rib cage and limit further internal injury. An Elevation Sling is used to support the arm on the injured side — see Skills and Procedures, **Slings**.

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## Fracture of the upper arm

The victim usually supports the weight of the elbow and lower arm to reduce the pain of the injury. This fracture can be very serious because of the risk of pressure on major nerves and blood vessels, especially those close to the shoulder and elbow joints. Any unnecessary movement should be avoided.

- Assist the victim into a position of greatest comfort, generally sitting in a chair or half-sitting with support. Allow the victim to support the arm on the injured side on a pillow or folded clothing.
- Check the pulse at the wrist at least every 10 minutes to ensure that the circulation is satisfactory.

Call 000 or mobile 112 for an ambulance.

- If the ambulance is likely to be delayed immobilise the injury with soft padding slipped between the upper arm and the chest wall. Fix the padding with a narrow-fold bandage around the chest wall and either above or below the injury site. Apply an Elevation Sling with the minimum of movement of the injured arm — see Skills and Procedures, **Slings**.

## Fracture or dislocation of the elbow

The elbow joint can be injured in a fall or by a sideways blow. The injury may result in the arm being either totally straight or else bent at the elbow. The injury must be stabilised without any attempt to alter the position of the arm because of the possibility of serious injury to major blood vessels and nerves around the elbow joint. Usually the victim will require ambulance transport to hospital for prompt medical assessment and pain relief.

- Assist the victim to either sit or lie down in the position of greatest comfort. Generally the victim will choose to lie down on the uninjured side and use the body as support for the injured area.

Call 000 or mobile 112 for an ambulance.

- Additional support can be improvised with soft padding between the arm and the body, with additional padding in the hollow where the waist meets the elbow joint. Fix the padding with narrow-fold bandages around the trunk and over the injured arm, but above and below the injury.

- Check the pulse at the wrist every 10 minutes to ensure that the circulation is satisfactory. If there is any difficulty finding the pulse, urgent medical assessment is required.

## Fracture of the lower arm or wrist

These injuries are very common, especially in children and the older adult. The wrist is often injured when a person falls onto an outstretched hand. Normally the victim can support the injured arm using the other arm, but additional immobilisation may be needed during transport to a doctor or hospital.

- Assist the victim into the position of greatest comfort, usually sitting down supporting the weight of the injured limb against the body with the other hand. A pillow or rolled up clothing may be placed on the lap to provide a soft support for the victim to use to rest the weight of the arm.
- Seek a prompt medical assessment. If ambulance transport is not used it is usually necessary to immobilise the arm to avoid more pain and muscle spasm.

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# Fractures and dislocations

- Apply a splint under the injured limb using a firmly rolled newspaper folded flat into a gutter shape. Hold the splint in place with narrow-fold bandage applied above and below the injury site, with an additional bandage if necessary.

- Apply an Arm Sling for additional support and stability — see Skills and Procedures, **Slings**.

## Fracture of the hand and fracture or dislocation of a finger

Injuries of the hand and fingers are common in some sports. Although it is tempting to replace a dislocated finger to relieve the pain and muscle spasm, there is a risk that a small nerve or blood vessel may be trapped and lead to a permanently numb or "dead" finger.

- Apply generous soft padding around the hand or injured finger(s), like a winter mitten.
- Apply an Elevation Sling, taking care to avoid touching the hand or fingers when tying the knot — see Skills and Procedures, **Slings**.

Seek prompt medical assessment.

## Fracture of the hip or lower leg

Injuries to the hip or lower limb can be very serious because of the risk of injury to major nerves and blood vessels. Usually there is severe pain, spasm and shock. Unless there will be a significant delay in the arrival of an ambulance, it is best to use blankets and pillows for support along the limb.

- Try to make the victim as comfortable as possible lying down, but without moving the injured limb. Protect the victim from extremes of heat or cold and use a blanket or coat to maintain body heat.

Call 000 or mobile 112 for an ambulance.

- Where there may be a wait of more than one hour for an ambulance, it may be necessary to immobilise the injured limb to relieve severe pain and muscle spasm. Pad well between the two legs, especially the hollows between the knees and ankles. Move only the uninjured limb and avoid any movement of the injured side. Tie the ankles together with a figure-of-eight using a narrow-fold bandage.

### Fractured hip

- Apply an ext a broad-fold bandage around the knees.

### Fractured lower leg

- As for a fractured hip but place an extra broad-fold bandage around the thighs.
- Depending on the injury site tie one or two narrow-fold bandages around the lower leg, above and below the injury, but not over the fracture site.

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## Fracture or dislocation of the knee joint

Injury to the knee often occurs in a vehicle accident where the knees strike the dashboard, and in body contact sports.

The injury is usually very painful with extensive muscle spasm.

- If the knee is dislocated or the kneecap damaged, apply light padding over the knee joint. Place support under the knee with a rolled sweater or towel to help ease the pain and muscle spasm. Raise both knees on additional padding if this can be done without adding to the victim's pain.

Call 000 or mobile 112 for an ambulance.

- In a remote area where an ambulance is likely to be delayed for more than one hour, immobilise the injured knee with narrow-fold bandages above and below the knee to stabilise the joint.

## Fracture or dislocation of the ankle, foot or toes

It is often difficult to decide whether an ankle joint is fractured or sprained and, whenever there is any doubt, the injury should be managed as a potential fracture. The foot and toes can be crushed by a heavy object, which results in a very painful and disabling injury.

- Assist the victim to lie down and try to raise the injured foot and ankle on soft padding as soon as possible to reduce pain and slow the onset of swelling.

**Unless you suspect an open wound on the foot or toes, leave a well-fitting shoe in place because removal may further complicate the injury.**

- If immobilisation is needed, use a sof pillow or rolled blanket around the foot and ankle. Apply two narrow-fold bandages to hold the padding in place.

- Arrange for a prompt medical assessment, OR

Call 000 or mobile 112 for an ambulance.

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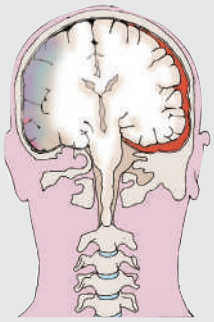
# Head injuries

## Background

The brain is composed of soft tissue and is protected by the skull, which is a strong, outer framework. The strength of the skull is sufficient to protect the head from injury in a minor fall or a light blow to the head. If stronger forces are involved, e.g. from falling onto the head from a height, or being kicked by a horse, the skull may crack or fracture.



**Concussion** occurs when the brain is shaken violently inside the skull. This results in the brain striking the inside of the skull, resulting in bleeding or swelling and bruising. There may be no outer sign of injury, but the damage to the brain is recognised by changes in behaviour caused by increased pressure within the skull.

**Compression** of the brain is a serious condition in which internal pressure can cause further injury. The pressure may be caused by a skull fracture, a collection of blood, a tumour or infection. Clear or blood-stained fluid may be seen leaking from the ear or nose and urgent admission to a hospital is required.

## Symptoms and signs

- Altered conscious state, often deteriorating over time
- Blurred or double vision
- A thumping or pounding headache
- Nausea or vomiting
- Loss of balance and hand-eye coordination
- Altered sensation in the fingers or down one side of the body
- Loss of short-term memory, e.g. the memory of recent events
- Noisy breathing
- A slow but strong pulse
- Unequal pupils
- Leaking fluid from the nose or one ear

## What to do — step by step

### 1 Assess the victim

- Assess the victim's conscious state.
- If unconscious and breathing normally, or not fully conscious and alert, place the victim in the recovery position, preferably with the injured side downwards. If there is any discharge from the ear, place a sterile or clean pad underneath, but do not pack the ear canal.

- Check every few minutes that the airway is clear and normal breathing is present. Be prepared to begin CPR if deterioration occurs — see **Resuscitation**.
- If **conscious**, encourage the victim to lie still because there is a possibility that a spinal injury may also be present with a head injury — see **Spinal Injury**, p. 68-6

Call 000 or mobile 112 for an ambulance.

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## 2 Give care until arrival of the ambulance

- Cover any wound with a sterile dressing.
- If there is any discharge from the ear or nose, cover the area with a sterile dressing.
- If fully conscious and alert, keep the head raised and supported to reduce further swelling and bruising around the brain.

**Do not pack the ear or nose with dressings because this can introduce infection and may increase the pressure on the brain.**

## 3 Observe the victim

- Observe the victim closely for any change in condition. Note any change in the conscious state, breathing and pulse rates, and be ready to begin resuscitation if necessary — see **Resuscitation**.
- If the victim appears drowsy and wants to sleep, assist into the recovery position with injured side downwards.
- Check the pupils of the eyes and not any change in size or differences in size and reaction to light. Note anything that appears to be unusual in the movement of the eyes — see **Assessment of a sick or injured victim**.

**Never try to keep a person awake after a head injury. The victim may need to sleep for recovery and efforts to prevent this may cause further bleeding or swelling around the brain.**

## 4 Treat for shock

- Minimise shock by covering the victim lightly with clothing or a blanket.
- Check for and treat any other injuries that may have been overlooked.

## 5 Until the ambulance arrives

- Stay with the victim and continue to observe the conscious state, pupils, breathing and pulse rates for any change.

**Always arrange for a doctor to check the victim of a head injury even if it appears that a full recovery has occurred.**

**In many cases, a victim's recovery from concussion may be followed by some months of headaches, tiredness, memory problems and the inability to concentrate. This is particularly hard for a person who is a student, and patience and understanding are required from parents, friends and colleagues.**

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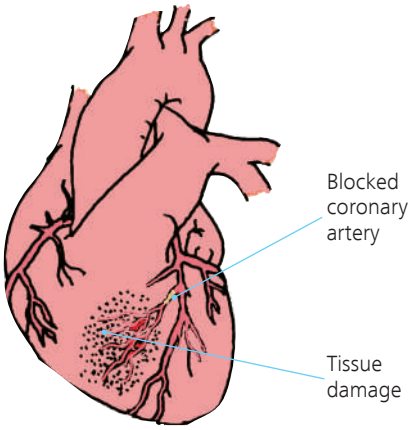
# Heart conditions

## Background

A **heart attack** is one of the most serious of several heart conditions that can lead to an emergency where lifesaving first aid is needed. A heart attack is also known as a **myocardial infarct** (MI) or by the old-fashioned term **coronary thrombosis.** When a heart attack occurs it is due to a blockage in one of the coronary arteries that runs around the outside of the heart to supply the heart muscle with blood. The severity of the attack depends on the location of the blockage: involvement of a small blood vessel will cause chest pain and other symptoms, but the victim should recover after medical treatment. Blockage of a major blood vessel can lead to sudden death in which even the best first aid is unlikely to save the victim's life.

An **angina attack** occurs where the victim has narrowed blood vessels around the heart. This is caused by fatty deposits (plaque) being deposited along the vessel walls and blood flowing with difficulty through those narrowed blood vessels. The pain of angina usually occurs during exercise or exertion when an insufficient blood supply causes chest pain and distress. Most angina victims carry prescribed medication that will relax the muscular walls of the affected blood vessels, allowing more blood to flow through and relieve the pain. Angina may lead to a heart attack one day and the victim should be treated as for a possible heart attack if a dose of their prescribed medication fails to relieve the pain within a few minutes.

**Congestive heart failure** is a condition in which the heart muscle is permanently damaged from long-standing heart disease or old age. Inefficient pumping of the heart causes fluid to collect in the lungs, legs and ankles, leaving the victim breathless and unable to move briskly. Congestive heart failure is a long-term illness that rarely causes a sudden collapse requiring urgent and lifesaving first aid.




## Symptoms and signs

- Pain or an uncomfortable pressure in the middle of the chest that does not ease after 10 minutes of rest
- The chest pain may
  - ~ radiate up the neck and into the jaw and teeth
  - ~ radiate into the shoulder or down one arm
  - ~ feel as if a crushing weight is resting on the victim's chest
  - ~ feel as if a steel band around the chest is being tightened
- Rapid breathing to reduce the pain and boost the oxygen supply to the heart
- A feeling of being short of breath and needing to keep the head high
- Rapid or irregular pulse rate with palpitations (but sometimes the pulse is slower than normal)
- Skin colour changes to either a pale or bluish appearance
- Feeling of light-headedness or fainting
- Perspiration, especially on the head and face
- Nausea
- Feeling of great anxiety, weakness or fatigue
- A request for a dose of any medication previously prescribed for angina pain
- Swollen legs or ankles if heart failure has been previously diagnosed
- Sudden collapse

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# Heart conditions

## What to do — step by step

### 1 Assist the victim to rest

- Help the conscious victim to rest in the position of greatest comfort, generally in a half-sitting position with support for the back and head.

- Give 300mg aspirin (usually 3 tablets) by mouth unless the victim is known to be allergic to aspirin.

### 2 Assess the victim

- Assess the victim's vital signs, including conscious state, breathing and pulse rates — see **Assessment of a sick or injured person**.

Call 000 or mobile 112 for an ambulance unless the pain eases totally with the prescribed medication. When in doubt, always send for an ambulance in case collapse suddenly occurs.

- Assist the victim to take any medication prescribed by a doctor for chest pain
- Be ready to give CPR if collapse occurs— see Resuscitation.

**Avoid giving any food, fluids or stimulants such as alcohol, cigarettes, tea or coffee because this could cause further stress on the heart and result in the victim's collapse.**

**Except in an extremely remote area, ambulance transport is always best for the victim because of the risk of collapse during travel.**

### 3 Try to keep the victim calm

- Try to keep the victim calm because any stress or activity could cause complications or even collapse.
- Loosen any tight clothing at the neck and waist to assist breathing.

### 4 Observe the victim

- Check the vital signs every few minute until the ambulance officers arrive. Note any change in the breathing and pulse rates.
- Stay with the victim in case deterioration or collapse occurs.

### Defibrillator

If a victim of a heart attack collapses, a defibrillator may be needed to restore a normal heart rhythm. If the heart muscle is quivering (ventricular fibrillation) use of an automated external defibrillator (AED) may be life-saving. Call an ambulance as soon as possible for any victim of a possible heart attack in case defibrillation is needed.

If an automated external defibrillator is available and first aid personnel have been trained in its use, standard CPR should be commenced and continued until the AED is completely ready for use. The first aiders should follow the audible prompts. An AED does not replace CPR but provides an extra step in emergency care — see also **Adult Defibrillation.**

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# Heat illness

## Hyperthermia

### Background

**Heat exhaustion** occurs when the victim becomes slightly dehydrated due to the constant loss of water in perspiration. Replacement of the water loss usually promotes a full recovery.

**Heat stroke** is a potentially irreversible and fatal response to exposure to extreme heat when the body is unable to maintain its normal regulation of temperature. The victim is seriously dehydrated and no longer able to cool the skin surface by sweating. As the internal body temperature rises, organ damage occurs to the heart, brain and kidneys and toxins are released into the circulation as the major muscles "melt down".

### Symptoms and signs

- Initially the victim may have muscle cramps, especially in the calves and toes
- Later there is exhaustion and general weakness
- Nausea, vomiting or diarrhoea
- Dizzy spell
- Pale, cool and clammy skin at first, becoming flushed and red later
- Rapid and weak pulse and rapid, noisy breathing.

### What to do — step by step

#### 1 Replace lost fluids

- Help the victim to lie down at total rest in a cool area. Loosen any restrictive clothing at the neck and waist. Raise the legs slightly.
- If the victim is fully alert and conscious, give frequent small drinks of water or sports drink. If the victim is too nauseated to drink, or is vomiting, give ice chips to suck and arrange for prompt medical treatment.
- If unconscious or not fully conscious an alert, place the victim in the recovery position, check that the airway is clear and normal breathing present. Be ready to begin CPR if collapse occurs — see **Resuscitation**.

**Call 000 or mobile 112 for an ambulance.**

- If muscle cramps occur, gently stretch the affected muscles to ease the pain.

**DO NOT give salt tablets or salt in any form to the victim of heat illness because it is likely to cause vomiting and may result in other complications**

#### 2 If heatstroke is suspected

- Cool the victim using wet towels, or cover the victim with a wet sheet and direct a fan across the surface. If shivering is noted, stop the active cooling but leave the wet towel or sheet in place.
- If ice packs are available, place them in the armpits and groins to aid cooling.

**Call 000 or mobile 112 for an ambulance because hospital care is essential.**

- While waiting for an ambulance to arrive, give small drinks of water every 15 minutes.

**Avoid giving long drinks because this may cause vomiting.**

- Keep the victim lying down at total rest and avoid any physical activity.
- If the conscious state deteriorates, place the victim in the recovery position and continue whole body cooling until the ambulance arrives.
- Check the vital signs at regular intervals, particularly the breathing and pulse rate, which will be a guide to the victim's progress. Be ready to begin CPR if necessary — see **Resuscitation**.

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# Hyperventilation

(Hysterical over-breathing)

## Background

Hyperventilation is a condition in which the breathing rate is faster than normal, resulting in an imbalance in the levels of oxygen and carbon dioxide circulating through the body. Severe stress or anxiety can cause the condition, which is why it is sometimes called "hysterical over-breathing". However, because the condition can result from a serious illness that requires urgent medical assessment and treatment, it should be recognised that prompt medical advice is usually required.

## Symptoms and signs

- Rapid and shallow breathing
- Feeling of dizziness or being "light-headed"
- Initial tingling of fingers and toes, followed by numb feeling
- Anxiety and a feeling of being unable to breathe freely
- Severe spasms of the fingers with the thumb pulled into the palm of the hand (known as "carpopedal spasm")

## What to do — step by step

### 1 Rest and reassure the victim

- If the condition is likely to be caused by recent stress or anxiety, help the victim to rest in a quiet area where there are no bystanders or observers.
- Reassure the victim that the unpleasant symptoms will disappear when a slower breathing pattern takes over.
- Advise the victim to try to slow the breathing rate and assist by counting each breath out loud, trying to reduce the rate gradually. Encourage the victim to match the counted rate and praise all efforts made.

**Avoid asking the victim to re-breathe from a paper bag, which is dangerous and can cause complications.**

- If the victim is successful at slowing the breathing rate, a gradual improvement will be observed. The victim should be able to relax and may be able to talk about any stress or personal problems that caused the attack.

**If the condition follows an injury, appears serious, or is worsening, call 000 or mobile 112 for an ambulance. If there is a possibility that poisoning might be involved or if the victim is a known diabetic, seek prompt medical advice.**

### 2 Seek medical advice

- If the victim needs ambulance transport for medical assessment, check the level of consciousness, breathing and pulse rates every few minutes and note any changes.
- If the condition is caused by stress, medical advice may be warranted after the victim has recovered to avoid a repeat attack.
- The victim should be encouraged to discuss the event with the family doctor or with a health counsellor if not in favour of seeking medical advice.

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# Mouth and tooth injuries

## Background

Injuries to the mouth and/or teeth can result from a fall on the face or a direct blow, such as a punch. A blow under the jaw can result in bitten lips or tongue. Such injuries can be associated with severe bleeding, which can be a risk to the victim's airway. Sometimes bleeding follows the extraction of a tooth when the initial clot breaks away from the tooth socket.

If a tooth is knocked out in a collision or fall, the correct first aid may save the tooth. If it is replaced in the jaw and followed up by prompt care from a dentist, it may survive. However, although a baby tooth from a small child is not replaced by the first aider, a dentist needs to check the mouth to avoid the risk of damage to the developing teeth.

Swelling in or around the mouth can be associated with an injury or severe reaction to a bee or wasp sting. A venomous bite or sting in or around the mouth can have serious consequences. Sometimes the body's allergic reaction to a venomous bite or sting elsewhere may cause extensive swelling. This can cause obstruction to the throat and upper airway for which prompt medical assessment and treatment are required — see **Allergic Reaction**.

## Symptoms and signs

- Bleeding from the mouth, lip, tongue or tooth socket
- Pain around or in the mouth following an injury
- A broken or displaced tooth
- Swelling in the mouth or around the jaw

## What to do — step by step

### 1 Assess the victim and the injury

- Check that the victim's airway is clear. If there is any risk of blood going down the throat or of increased swelling of the mouth, tongue or throat, turn the victim on the side into the Recovery Position and treat as for an unconscious victim.
- If the bleeding is only slow or moderate and there appears to be no breathing difficulty, assist the victim into the position of greatest comfort, generally sitting or half-sitting and check for the site of any bleeding.

### 2 Control any bleeding promptly

- Apply firm pressure to any bleeding wound or tooth socket. Fold a sterile dressing or clean tissue into a pad and ask the victim to hold it firmly on the bleeding site for at least 10 minutes.

- If bleeding is coming from a cut lip, advise the victim to hold the injured area firmly between the folds of a moist tissue or dressing.

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# Mouth and tooth injuries

**If a tooth has been knocked out:**

- Ask the victim to suck it clean and then try to replace the tooth in the original position in the socket to keep the root alive. A small piece of folded aluminium foil may be used as a splint to fix the tooth in place until a dentist is available.

- Wrap the foil splint over at least one tooth on each side of the replaced tooth. Ask the victim to bite down firmly on the splint to keep the tooth root in contact with the tissues of the jaw.
- If the victim cannot assist with replacement of the tooth in the socket, try to keep the tooth moist and clean. Ask the victim to carry the tooth in the mouth between the lower front teeth and lip where it will be bathed in saliva.
- If the victim is **unconscious** and it is considered unsafe to carry the tooth in the mouth, place it in a clean container with a little milk.

**DO NOT place the tooth in water because this can damage the membrane and cause the tooth to be rejected by the body.**

**If a small child loses one of the first 'baby' teeth, there is no need to attempt replacement. However, prompt dental advice should be obtained in case the permanent tooth has been damaged in the jaw.**

**If the bleeding follows the extraction of a tooth by a dental surgeon:**

- Ask the victim to bite down firmly over a pad that covers the tooth socket. If a large, jelly-like clot is present, ask the victim to have a mouthwash with salty water to remove the clot, which will make it easier to stop the bleeding from the tooth socket.
- Continue to maintain pressure over the pad for at least 10 to 20 minutes to allow a new clot to form.

**Avoid giving any food or fluids to the victim because of the risk of later complications if an anaesthetic is required.**

## 3 Obtain medical or dental advice and care

- If the injury involves a tooth or the jaw, arrange prompt transport to a dentist or dental hospital. Unless suffering with severe shock the victim may be transported in a private vehicle in the head up position.
- If the injury involves bleeding or swelling o the mouth or throat, seek prompt medical advice.

If there is any risk to the airway from heavy bleeding or increasing swelling, call 000 or mobile 112 for an ambulance.

## 4 Observe the victim

- Observe the victim s level of consciousness at frequent intervals and be prepared to begin CPR if necessary. Continue CPR until the ambulance arrives — see **Resuscitation**.

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# Poisoning

## Background

A poison is a substance that causes injury, illness or death if it enters the body. Poisons may enter the body in the form of liquids, solids, or gas and vapour fumes.

Poisons can enter by:

- **Ingestion** through the mouth and digestive system
- **Inhalation** of fumes through the lungs
- **Absorption** of a chemical or plant extract through the skin
- **Injection** of drugs of abuse or by substances from venomous creatures — see **Bites and stings** or **Drug overdose.**

## Symptoms and signs

Depending on the substance involved and entry route, the following may occur:

- Nausea or vomiting
- Diarrhoea
- Profuse sweating
- Abdominal pain
- Unconsciousness or deteriorating conscious state
- Seizures
- Breathing difficulty

## General management of poisoning

### 1 Check for safety before approaching the victim

- Ensure safety for yourself, victim and any others before approaching to give first aid. If safe and necessary, remove the victim to a safer area.
- Note any information about the nature of the poisoning incident, e.g. tablets, berries, burns around the mouth etc.
- Use any recommended Personal Protective Equipment (PPE).

### 2 Check the victim's level of consciousness

**If unconscious**

- If breathing normally, turn the victim on the side to clear and open the airway.

- If not breathing normally, begin CPR — see **Resuscitation**.
- If there are burns around the mouth, wipe the area clean before starting CPR — see **Resuscitation**.

Call 000 or mobile 112 for an ambulance immediately.

**If conscious**

- If the mouth is burnt from a corrosive poison, wipe the area with a moist cloth or tissues.

### 3 Call the Poisons Information Centre

Call 13 11 26 for specific advice on the first aid management required. Follow all instructions concerning medical advice or ambulance transport to hospital.

- Check the victim's level of consciousness every few minutes and note any changes.

**Do not give the victim anything to eat or drink unless told to do so by the Poisons Information Centre consultant.**

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# Poisoning

## Ingested (swallowed) poisons

Ask the conscious victim to wash out their mouth and keep any evidence to go to hospital with the victim, e.g. tablets, containers, berries etc.

## Inhaled poisons

### 1 Check for safety before approaching the victim

- If poisonous fumes are present in a confined space, the victim needs to be moved into fresh air as soon as possible. The first aider may need to enter the space if the victim is unconscious and must be dragged to safety. However, the first aider should take no undue risks.

- When it is safe to do so, check the victim's level of consciousness and give general care for poisoning.

**If a toxic chemical has been inhaled, there is no risk for the first aider performing resuscitation in the open air but extra efforts should be made to avoid all exhaled air from the victim.**

**If a bag-valve-mask unit is available and the rescuer trained in its use, this is safer for resuscitation where toxic chemicals or vapours are likely.**

## Absorbed poisons

### 1 Check for safety before approaching the victim

- Help the **conscious** or semi-conscious victim to remove any contaminated clothing and wash all affected areas of the skin surface. The first aider should avoid contact with the discarded clothing and skin of the victim, especially when agricultural chemicals are involved.

Call the Poisons Information Centre (PIC) on 13 11 26 as soon as possible for specific advice on first aid management.

Call 000 or mobile 112 for an ambulance.

## Injected poisons (excluding venoms)

- Check the area for evidence of an injected drug being used.

- Keep any relevant items safe to assist with later identification of the substance taken.

**If the victim is conscious, be careful to avoid direct contact because there may be rapid changes in mood with a quiet victim suddenly becoming violent and aggressive.**

Unless the victim is recovering rapidly and is in the care of a responsible adult, call 000 or mobile 112 for an ambulance.

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# Shock and fainting

## Background

**Shock** is the body's response to stress, e.g. sudden illness, injury, pain, fear or fright etc. If the stress is relatively minor, e.g. a cut finger, the body compensates quickly by increasing the oxygen supply with an increased breathing rate. In addition, **the heart rate increases** to circulate the extra oxygen around the body and especially to the vital organs including the heart muscle itself, the lungs and the brain.

To boost the oxygen supply to the vital organs, the smaller blood vessels throughout the body constrict to allow blood to be withdrawn from the skin surface and digestive tract. This may result in pale, cold and moist skin, with nausea or vomiting as blood leaves the stomach.

If the victim has lost a significant amount of blood through a major wound, or is severely dehydrated owing to vomiting, diarrhoea, heat stroke or extensive burns, the body may not be able to compensate with additional blood flow although the heart rate increases. When this happens the degree of shock experienced may be severe or even life threatening, due to the eventual collapse of the circulation.

**Fainting** is a condition in which a person loses full consciousness caused by blood pooling in the legs and not reaching the brain. It can result from prolonged standing in one position, especially on a hot day, or following pain or an emotional upset. A person who is suffering a fainting attack is likely to have **a slow pulse**.

## Symptoms and signs may include:

- Rapid breathing rate (called "air hunger" in severe shock)
- Weak and rapid pulse rate in shock
- Slow pulse in fainting
- Pale, cool and "clammy" skin
- Nausea or vomiting
- Anxiety, confusion & restlessness
- Deteriorating level of consciousness

## What to do — step by step

### 1 Assess and manage the injury or illness

- Check the victim's level of consciousness:

**If unconscious**

~ turn the victim on the side to clear and open the airway

~ if normal breathing is absent begin CPR — see **Resuscitation**.

- Control any obvious bleeding — see **Bleeding**.

Call 000 or mobile 112 for an ambulance.

**If conscious**

- Assist the victim into the position of greatest comfort, preferably lying down.
- If shock is due to trauma and no injuries present, the legs may be raised.
- Loosen any tight clothing at neck and waist to help the victim relax and obtain more oxygen.

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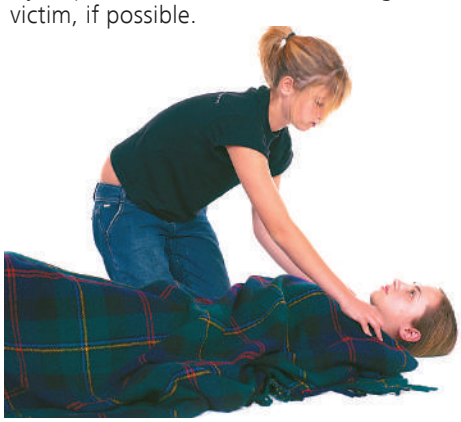
## 2 Reassure the victim at frequent intervals but avoid discussing any injuries

In shock, the victim is often unaware of the extent of any injuries received. Avoid drawing attention to the illness or injury because this may add to the degree of shock.

## 3 Check the victim's level of consciousness and other signs of life every few minutes and note any changes

## 4 Maintain body temperature

- Maintain a normal body temperature as far as possible, depending on weather conditions. If it is cold or wet, place a blanket, coat or newspapers under and over the victim to reduce heat loss. If it is a warm day, cover the victim lightly and try to provide shade without moving the victim, if possible.



On a hot day the surface on which the victim is lying may cause further injury, including surface burns. Always check the surface on which the victim is lying to avoid the risk of further injury.

- If the victim complains of severe thirst, moisten the lips with a damp cloth, or give an ice chip to suck.

**Avoid giving the victim any food, fluids or stimulants such as alcohol or a cigarette. In severe shock the victim is unable to digest food and may have an injury that requires an operation under an anaesthetic.**

## 5 Obtain medical help

- Ensure that an ambulance has been called for any major incident where shock or the underlying illness or injury is severe.
- If the underlying condition is minor, e.g. a cut finger, the degree of shock may not be severe and the victim should respond to a period of rest and reassurance.
- When the victim has recovered arrange for medical advice and treatment, depending on the illness or injury.

## 6 Fainting

- Manage the victim as for shock but, if conscious and responding to your voice or touch, raise the legs to boost the return of blood to the heart.

- If the victim's conscious state deteriorates, turn on the side to clear and open the airway.

**When in doubt about the severity of the victim's condition, always call for an ambulance.**

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# Spinal injuries

## Background

Spinal injuries may be caused by any strong forces affecting the head, back, chest, feet or legs. A person falling from a height may land in a range of positions. The spine is often jarred even when the victim lands face down on the chest. A road traffic accident is a common cause of spinal injury, where the victim is a passenger in a vehicle involved in a collision or where a moving vehicle strikes a pedestrian or other road user.

A spinal injury may occur in sport or recreation, especially in a body contact sport such as rugby, or from striking a submerged object when diving into shallow or murky water. In severe cases, the victim may be paralysed below the level of the injury, e.g. from the waist downwards for a mid or lower back injury (becoming a paraplegic), or from the neck and shoulders downwards if the injury involves the neck spine (becoming a quadriplegic). If the victim is paralysed and floating face down in water, death will occur unless a rapid rescue is performed.

Injuries to the spine are often associated with a head injury and this must be taken into account when assessing the victim and managing the injury.

## Symptoms and signs

- Pain in the head, neck or down the spine
- Altered sensation, tingling/numbness of fingers or toes
- Loss of power/function in the upper and/or lower limbs
- Altered level of consciousness
- Bleeding or blood-stained fluid leaking from an ear/nose
- Headache
- Giddiness and loss of balance and coordination
- Nausea or vomiting
- Wounds or bruising in the area of impact.

## What to do — step by step

### 1 Assess the victim

- Check the victim's level of consciousness:

**If unconscious and breathing normally**

~ turn the victim onto the side in the recovery position, avoiding any forwards movement of the head and neck

~ if possible, especially if a helper is available, support the head during the turn, but do not delay making the turn to do so.

**A clear and open airway always takes priority over any possible injuries, including a spinal injury. A person may die quickly from an obstructed airway, whereas the spinal injury may not be as serious as bystanders anticipate.**

Call 000 or mobile 112 for an ambulance.

**If conscious**

- If a bystander is available, ask the person to hold the victim's head still.

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# Spinal injuries

- Carefully assess the victim's injuries without any unnecessary movement
- Check first for any bleeding wound and apply a pressure dressing to avoid unnecessary blood loss
- Cover any minor wounds to protect against further injury.

**Note any obvious deformity of limbs, hands or feet and use improvised padding to support the injured area without moving the victim.**

## 2 Rest and reassure the victim

- Reassure the victim that trained assistance is on the way.
- Try to make the victim as comfortable as possible without moving the head, neck or spine.

**As a general rule, ask the conscious person to move a limb while something is placed underneath. DO NOT attempt to move any part of the body yourself, even if trying to make the victim more comfortable. For example, if the victim can lift the head enough for you to place soft padding underneath there is little risk of further injury.**

- Maintain body temperature with a suitable covering over the victim. If the weather is either very hot, cold and/or wet, gently ease some clothing or newspaper under the limbs and head to avoid transfer of heat or cold from the underneath surface to the victim's body.

## 3 Observe the victim for any change in the level of consciousness

- Check the level of consciousness every few minutes and note any changes.
- If there is any deterioration in the conscious state do not hesitate to roll the victim onto the side to protect the airway.

## Spinal injury in water

If a spinal injury is suspected in a conscious victim seen floating in water, first aid management includes caring for the victim in the water until the arrival of an ambulance.

**Any attempt to remove the conscious victim from water without adequate and trained personnel and equipment may cause serious or even fatal complications to a spinal injured person. Unless in very rough water, e.g. at sea, it is always best to leave the victim safely supported by a strong swimmer in the water.**

**A conscious but totally paralysed victim is unable to change position unaided and may drown unless turned over promptly.**

## 1 Support the victim's head, neck and upper body to keep the airway clear of the water

## 2 Maintain a straight alignment of the spine

- Tow the victim with traction on the head and neck. It is easier to maintain traction and flotation while towing the victim gently. Avoid any violent movements or sudden changes in direction.

## 3 If the victim is unconscious

- Remove the victim from the water without delay and check for normal breathing. If necessary start CPR — see **Resuscitation**.

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# Sprains, strains and bruises

## Background

Injuries that involve body tissues apart from bone are generally classified as **soft tissue injuries**. Sprains, strains and bruises are all soft tissue injuries, although the cause and tissues involved in each injury are different.

A **sprain** is an injury that involves the ligaments and other soft tissues around a joint, such as an ankle or wrist.

A **strain** occurs away from a joint and involves a torn or over-stretched muscle or tendon, commonly in the calf, thigh or lower back.

A **bruise** is a soft tissue injury that involves the skin and nearby tissues following a blow or other forces that break a blood vessel close to the surface of the body. Bruising may be seen with a sprain or strain. The colour of the tissues may indicate the time of the injury: initially the tissues are reddened, then change to purple and, as the blood is slowly absorbed back into the body, the tissues become bluish.

A **dislocation** is where a bone has been displaced from its normal position at a joint. Some joints are more likely than others to dislocate under a sudden, severe force, e.g. the shoulder or a finger joint. As a general rule, a dislocation injury should be managed as a fracture — see **Fractures**.

## Symptoms and signs

- Pain at the site of the injury, often severe with a sprain or strain
- Loss of power in the injured area, especially with a sprained joint
- Swelling of injured area
- Nausea
- Feeling faint or giddy
- Pale, cold and clammy skin, due to shock

## What to do — step by step

### 1 Assist the victim into a comfortable position

- Assist the victim into the position of greatest comfort, generally sitting with support or lying down.
- Raise the injured area if possible to limit any further bleeding into the damaged tissues. For a sprained ankle or strained calf muscle, raise and support the lower limb on padding made of rolled up clothing or a blanket, etc. For an injured arm or wrist, support it in a raised position or rest the limb on some rolled up clothing or a pillow.

- If the victim is visibly shocked, with pale cold and clammy skin, elevate the injured area but try to keep the victim lying down.

### 2 Apply a firm supporting bandage

- Use a good quality crepe or elasticised crepe roller bandage on an injured limb.
- Ensure that firm and even pressure is applied to the injured part without slowing the circulation of blood to the fingers or toes of the affected limb.
- If the injured part is too painful or swollen to apply a bandage, use cotton wool padding around the injury first and bandage firmly over it. Leave the bandage in place for at least 10 minutes.

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## Sprains, strains and bruises

- If the injury is not on a limb, apply firm hand pressure over a bulky pad for at least 10 minutes.

### 3 Apply an ice pack to the injured area

- After 10 minutes of compression, elevation and rest apply a wrapped ice pack over the injured area.
- If a prepared ice pack is not readily available, fill a plastic bag with crushed ice and seal it well. Alternatively, a pack of frozen vegetables may be used if ice is not available.

- Leave the ice pack in place for no more than 10 minutes. Then remove it and reapply the supporting crepe bandage.
- When the skin has regained a normal or warm temperature to touch, the ice pack may be reapplied for no more than 10 minutes at a time. An ice pack should not be reapplied if the skin still feels cold to the touch.

**Never apply an unwrapped ice pack directly over the skin surface because it may cause a burn or complicate the existing injury.**

**Never use an ice pack for longer than 10 minutes at a time on a child or older adult. On any victim always check the colour of the skin at frequent intervals. Remove the ice pack if the skin changes from white or blue to a pink or red colour because this indicates an increased blood flow to the part, which will cause more internal bleeding.**

### 4 Keep the injured area at total rest and arrange for medical advice

- Ensure total rest with elevation of the injured area for the first 20-30 minutes following the injury. This will allow initial control of any bleeding into the tissues.
- Arrange for a prompt medical assessment of the injury.

**If the victim is still shocked and in severe pain, or unable to be assisted to a car for transport, call 000 or mobile 112 for an ambulance.**

**If the injury involves the lower back or neck, an ambulance is the best form of transport to avoid the risk of further injury and stress.**

**Avoid the use of heat packs and warmth until the tissues have regained normal skin temperature, which usually takes two or three days. Application of heat in any form while the injured part feels hot to the touch may cause more bleeding into the injured tissues.**

**Avoid the use of an ice pack before the victim has had 10 minutes of compression with a bandage, elevation of the part and rest. Ice packs can delay clotting and thus may prolong the bleeding into the injured area.**

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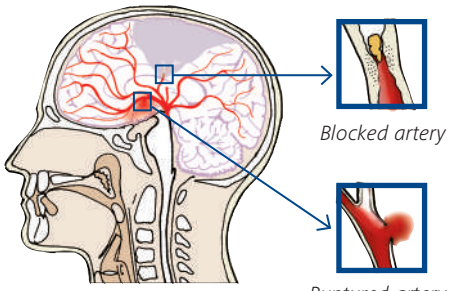
# Stroke

## Background

A stroke is a condition in which part of the brain is affected by an interruption to the normal blood supply. This can result from **a clot in a blood vessel** that stops blood passing through to brain tissue. If this condition is recognised at an early stage and hospital care is readily available, drug treatment is available to dissolve the clot, resulting in a full recovery.

Sometimes a stroke is caused by **a burst blood vessel** when the internal bleeding in the skull causes pressure on brain tissue. At first, the victim may have a severe headache but it can lead to paralysis down one side of the body and even the loss of the ability to speak.

Occasionally a person may have a minor stroke in which there is weakness down one side of the body and/or loss of speech for a few minutes only. This is called a **transient ischaemic attack (TIA)** and is usually followed by a full recovery. Other attacks may happen later and a major stroke may occur at any time.



*Blocked artery*

*Ruptured artery*

**Use the concept of FAST to assess three specific signs of stroke:**

**F**acial weakness - can the person smile? Does the mouth or eye droop?

**A**rm weakness - can the person raise both arms?

**S**peech problems - can the person speak clearly and understand what you say?

**T**ime to act fast - call **000** or **112** for an ambulance.

## Symptoms and signs

- Moderate to severe headache
- Tingling, weakness or numbness down one side of the body
- Loss of muscle tone of the face muscles, with dribbling from one side
- Nausea
- Unequal pupils; blurred or double vision
- Loss of bladder or bowel control
- Loss of speech or the uttering of meaningless sounds
- Loss of balance and coordination
- Deteriorating conscious state or unconsciousness

## What to do — step by step

### 1 Assess the victim's level of consciousness

- If **unconscious** and breathing normally, or if not fully alert, place the victim in the recovery position but with the **weak or affected side downwards.**

- Check the airway and breathing every few minutes. Be ready to begin CPR if required — see **Resuscitation**.

Call 000 or mobile 112 for an ambulance.

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## 2 Care for a conscious victim

- Assist a **conscious** victim into the position of greatest comfort.

**Whether lying down or half-sitting, keep the head raised and supported to reduce any additional pressure on the brain.**

- Reassure the victim that you will stay until an ambulance arrives. If the victim is very distressed by loss of muscle tone and function, or loss of normal speech, maintain reassuring contact by holding the victim's hand on the unaffected side.
- Using the **FAST** concept, assess any loss of muscle tone or weakness down one side. Look for any drooping of the eyelid or facial muscles and any dribbling of saliva. If the victim cannot control saliva in the mouth due to loss of swallowing and coordination, tilt the head slightly to the affected side and provide a cloth or tissues to absorb any secretions.

- Note any speech difficulty or inability to speak coherently. If the victim is making mumbled sounds and is distressed by the inability to communicate, keep giving reassurance that the problem may not be permanent. Encourage the victim to rest quietly without trying to speak.

## 3 Check the victim's level of consciousness, breathing and pulse rates every few minutes

- Note any changes and, if there is any deterioration in the victim's conscious state, turn the victim into the recovery position and check the airway and breathing every few minutes. Be prepared to begin CPR if necessary — see **Resuscitation**.

**Avoid giving food or fluid to a conscious victim because swallowing may be impaired.**

**It is vital to obtain urgent ambulance transport to hospital because medical treatment for a stroke caused by a clot in a blood vessel must be started within two hours to be totally successful. As this "clot buster" treatment cannot be given to the victim of a bleeding vessel in the brain, a number of tests have to be carried out beforehand to ensure that the correct treatment is given.**

**Although the experience of suffering a stroke is very frightening for the victim, if prompt medical treatment is given followed by rehabilitation therapy over a period of time, improvement is achievable for many victims.**

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# Principles of first aid

## First aid

First aid is the care given to a victim of illness or injury until the arrival of an ambulance officer, nurse or doctor.

**The four aims of first aid are to:**

- Preserve life by keeping the victim safe and giving correct first aid
- Protect the unconscious victim who may need correct positioning or resuscitation
- Prevent the condition from worsening by giving lifesaving first aid
- Promote recovery by controlling bleeding or giving resuscitation, as required.

## Cultural awareness and respect

When assisting a sick or injured person the first aider should show respect and be aware of cultural issues. English may not be their first language and a woman might be uncomfortable accepting first aid from a man etc. In some cultures direct eye contact may be impolite.

## Legal implications of first aid

For specific information on the legal implications of giving first aid to another person it is recommended that any individual should seek advice from a registered legal practitioner. The following material should be used only as a guide to the legal implications relevant to first aid in an emergency.

A first aider may be an off-duty nurse or an untrained bystander but, under Common Law, any person who sees an emergency may decide to assist the victim of sickness or injury until more highly trained assistance becomes available. As a general rule, a first aider should only hand over responsibility for care of the victim to a doctor, nurse or ambulance officer.
In the interim there are four considerations that the first aider should consider in an emergency:

1. Duty of care
2. Consent
3. Negligence
4. Recording

There is no legal obligation to assist a sick or injured person in an emergency unless a **duty of care** relationship exists. 'Duty of care' is phrase that outlines the legal relationship owed by one individual to another, e.g. as the designated workplace first aid officer in a workplace emergency, or as a designated child carer in a school or kindergarten. In these examples it is clear that there must be provision for first aid facilities to be available to the victims of an emergency when it is unlikely that the individual concerned is able to apply self-help first aid.

If a duty of care relationship exists the first aider should not be intimidated by fears of litigation the first aider should give emergency care that is:

~ prudent and reasonable in the circumstances
~ in the best interests of the victim
~ based on skills and knowledge acquired during formal first aid training
~ unlikely to make the victim's condition worse, or complicate the illness or injury.

For these reasons, the first aider should confine any emergency actions to those contained in a reputable first aid manual and use only equipment for which full training and accreditation has been given.

In another example, if a person is involved in a road accident, e.g. as a driver or cyclist, in all States and Territories there is a legal requirement to:

- stay at the scene
- assist the injured (to the best of your ability)
- report the incident to police.

**Consent** is another legal consideration. If the victim is conscious, consent should be sought from the victim before any first aid treatment is started. If the victim is under the age of 18, consent should be obtained from a parent or guardian but, if the child is unaccompanied, first aid should be given in good faith. If the victim is unconscious, consent is assumed and first aid should be given. However, any first aid should be confined to essential care and be within the scope of your first aid qualifications.

**Negligence** is often a major concern for the first aider, despite the fact that it is unlikely that any victim would later attempt to sue the person who administered care in an emergency. Although such action is unlikely, it would be up to a court to decide whether the first aider was guilty of gross negligence resulting in further harm to the victim. To date in Australia there has been no successful litigation against a first aider. In most State and Territory legislation there is a "Good Samaritan" clause that covers the situation in which a first aider does their best in an emergency whatever the outcome. This clause relates only to first aid treatment for which there is no fee charged.

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**Recording** is a legal responsibility for any incident, whether major or minor. It is essential that the first aider records the details of any incident at which first aid is given. Such records may be used to protect the first aider at a later date and may be used in court in some circumstances. Thus any report should be:

~ written in ink (and not in pencil or altered with correction fluid)
~ signed and dated by the first aider
~ without alterations unless these are made in ink and initialled by the first aider
~ kept confidential unless requested by a legally authorised person.

## Workplace first aid

In all States and Territories there is Workplace Health and Safety legislation that requires employers to provide first aid for any employee who is injured or becomes ill at work. This legislation varies across Australia depending on whether it is a Regulation, Code of Practice or Advisory Standard under an Work Health and Safety Act. But the impact is the same.

For example, the legislation can require a large work place to provide a first aid room in which a Health Nurse or First Aider carries out first aid treatments. The requirements for first aid and first aid equipment are based on a process of risk assessment in each area of work. Thus the employer is obligated to determine the following requirements for the individual workplace including the:

- number and distribution of employees and their working shifts, including access to emergency telephone or radio communications etc.
- nature of the work being performed, which will varyfrom one worksite to another in a large enterprise
- identification and risk of any hazards in those worksites and the nature of that risk
- locations of the worksite, whether in a metropolitan area or at a remote location, and the anticipated time for any emergency assistance to reach the victim
- known previous occurrences of accidents or illness, including any recorded "near-miss" events
- selection and availability of first aid equipment and associated staff training
- written policies and procedures for the management of any emergency, including the provision of translated versions to meet the language requirements of any employees for whom English is not their first language.

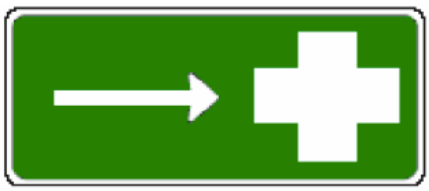
If the first aider is employed to give first aid, e.g. as a first aider in a large industry, then that person has a legal duty of care to give first aid to any victim of illness or injury at that workplace. This requires the designated first aider to attend regular revision sessions to maintain their level of first aid competence and to ensure that their qualifications remain current at all times.

In addition to carrying out first aid treatments, the person who is designated as the workplace first aider has several other duties, including:

- completing and filing accident and illness reports
- reporting of hazards highlighted by an occurrence where first aid has been needed
- notifying any treatment trends, e.g. frequent eye strain reports or requests for analgesics
- referring victims to an appropriate medical facility after treatment has been given
- cleaning and restocking the first aid room and/or first aid kits.
- maintaining confidentiality to ensure that personal information is not discussed with other employees.

First aid kits should be checked regularly and especially after any first aid has been given. These checks should include a survey of expiry dates on any items, which is especially important for solutions including antiseptics and eye treatments, such as normal saline irrigation fluid. Some consumable items may be purchased in bulk for economic reasons, but the first aider should maintain each kit to the level that complies with local legislation. Replenishment items should be kept in a locked cupboard to assist the first aider to refill the kit at any time after use. It is prudent to maintain a record of first aid kit checks, especially in a large workplace. This process can be simplified by introducing a numbering system for each kit, which will also aid in tracking any kits that have been moved to another location.

Finally, the designated workplace first aider must ensure that full training has been given for any item of first aid or emergency equipment used in the workplace. Unless trained in the use of a stretcher or oxygen it is wise to wait for the arrival of an ambulance before attempting to use this equipment.



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# Assessment of a sick or injured person

In any emergency and when it is safe to do so, the first aider should:

~ assess the area

~ assess the victim.

## Assessment of the emergency area

You may be alerted to the possibility of an emergency by various unusual sights and sounds, or by seeing a person who appears to be either sick or injured.

Before assessing the victim, it is vital to check that the area is safe for you, the victim and bystanders.

Hazards might include:

- **traffic — see Road accidents**
- **electricity, both high and low voltage— see Electricity**
- **deep water or rough, fast-flowing water— see Water**
- **poisonous gases, chemicals or fumes — see Chemicals**
- **fire — see Fire**

## Assessment of a sick or injured person

Assess the nature of any injury or illness and set priorities for the care required.

If the victim appears collapsed, first check the victim's response to a shouted command and to a firm squeeze of the shoulders. If the collapsed victim does not respond, then be prepared to resuscitate — see **Resuscitation**.

If the victim responds to your voice, then obtain their consent and plan any emergency treatment required.

Unless the injury or illness appears to be trivial, ask a bystander to call **000** or mobile 112 for an ambulance and then follow these simple steps:

**1** Ask the victim and any bystanders for the **history** of the problem, outlining what happened, the time of onset and whether there is any known underlying health problem, such as asthma, diabetes, epilepsy or heart condition. Quickly check for a Medic Alert bracelet or necklet, which may list any major health problem.

**2** Ask the victim to describe any **Symptoms**, including pain, soreness or discomfort and any other unusual sensations such as numbness or tingling in the fingertips.

**3** Check the victim carefully, looking for any **Signs** of injury or illness, basing your observations on the history and any symptoms described. After an injury, look for any of the following:

- bleeding
- bruising
- wounds
- swelling
- deformity (when one side is compared with the other)
- loss of power or function

**4** Depending on the outcome of your initial assessment, refer to the relevant page of this handbook for management of bleeding, a wound, chest pain, asthma etc.

**5** When initial treatment has been given, maintain close observation of the **vital signs** every few minutes to indicate any change in condition or deterioration requiring a change in management.

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### The vital signs are assessed as follows:

- **Conscious state:** check the conscious state approximately every few minutes and note any changes, especially any deterioration. Check if the victim is fully conscious and responding coherently, or only semi-conscious e.g., groaning.
- **Airway:** ensure that it is clear and open and that the victim does not have any secretions that might obstruct breathing
- **Breathing:** check for normal breathing; note the rate and rhythm for any changes. Check whether the breathing is deep or shallow, quiet or noisy, and whether there are any abnormal sounds such as wheezing on breathing out. This is especially important with the unconscious victim because any change may be a warning of deterioration.

- **Circulation:** note any changes in the pulse as a guide to progress. Check whether the pulse is fast or slow, strong or weak, regular or irregular. In both the unconscious victim **who is breathing normally** and the conscious person, the pulse should be checked at the underside of the wrist on the base of thumb.

- **Skin**: look at the skin and note the colour (whether tinged with blue), and feel whether it is hot (with fever) or cold and clammy (as in shock).

If deterioration occurs, turn the victim on the side into the recovery position.

Call 000 or mobile 112 for an ambulance.

OBSERVATION CHART

Full name Date

Department **Time**

| Time | | | | | | |
|---|---|---|---|---|---|---|
| Conscious state | Fully conscious | | | | | |
| | Semi-conscious | | | | | |
| | Unconscious | | | | | |
| Temperature | °C | | | | | |
| Pulse | Rate | | | | | |
| | Rhythm | | | | | |
| | Volume | | | | | |
| Respiration | Rate | | | | | |
| | Rhythm | | | | | |
| | Depth | | | | | |
| | Sound | | | | | |
| Skin | Colour | | | | | |
| | Condition | | | | | |
| | Temperature | | | | | |

## Handover communication with emergency services personnel

When handing over care to emergency services personnel, include:

- name and details of the victim
- summary of the incident
- time frames around the incident
- any previous medical history (if known)
- any emergency care given.

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# First aid and safety

## Background

The first aider must consider the safety of the victim, self and any bystanders before attempting to rescue and assist a sick or injured person. There are many situations in which great care must be taken because of the presence of a specific hazard, such as high-voltage electricity cables, fire, toxic fumes or road traffic.

## Electricity

### Domestic electricity

Although the domestic electricity supply is low-voltage, accidental contact with a live conductor can cause serious injury or death. A characteristic injury is seen as an entry burn at the point of contact, plus a more extensive exit burn where the electricity went to "earth".

The first aider must remember to make the area safe before attempting to touch or rescue the victim. The source of electricity must be identified and contact broken in the easiest but safest manner. If it is possible to remove an appliance plug from the power supply point, then this will stop the flow of electricity. It is quite inadequate to rely on the power point switch because it is still possible for electricity to flow even after the power point switch has been turned off. Alternatively, the power should be turned off at the mains supply board to ensure safety for all concerned.

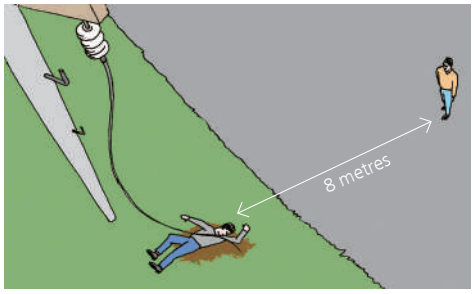
When a safe rescue is possible, the first aider should check the victim following the Basic Life Support Flow Chart and be prepared to give CPR if necessary — see **Resuscitation**.

If the victim does not need CPR, the first aider should check for any burns, looking carefully for the exit burn that is likely to be the most serious injury. First aid treatment is needed to protect any wound and reduce further damage — see **Burns**.

**New homes are required to install Residual Current Devices (RCDs) or special Safety Switches that stop the flow of electricity in any electrical emergency. Many older homes have upgraded their power installation with RCDs to make it safer for family members. Larger premises such as offices or factories are required by law to have similar safety devices installed for the protection of employees.**

### High-voltage electricity

The electricity supply that is seen in the street and which runs between power poles is both low and high-voltage. High-voltage power may be found at major factories and workshops. If a high-voltage power cable is brought down in an accident, it is very dangerous for anyone in the area. High-voltage electricity can travel up to 8 metres from the cable, and possibly further in damp or wet conditions. Therefore, as bystanders do not know the voltage concerned, they must remain more than 8 metres from the power cable: no first aid or emergency care can be given until the electricity supply authority has declared the area safe.




An accident victim cannot be rescued from an area that has been energised by high-voltage power but the first aider should shout advice and warn the victim against any attempt to move or leave the area. If the victim has survived the initial accident, their survival may depend on staying in one place until a safe rescue can be carried out after the power has been disconnected.

If a driver is trapped in a car with a high-voltage cable in contact with the vehicle, the victim is safe as long as there is no attempt to leave the car. Again, advice can be shouted to the conscious victim and reassurances given that the emergency services have been called and are due to arrive at any moment. For example, if the conscious victim has a bleeding wound, shouted advice can be given to apply pressure with elevation and rest.

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## Water

If a person has fallen into water and is either unconscious, or unable to swim, the rescuer needs to take great care to avoid personal injury, especially if not a good swimmer. Unless the rescuer is an excellent swimmer, no attempt should be made to rescue a victim from deep water.

When attempting to rescue a person from water, use a rope, flotation device, tree branch or large towel to avoid having direct contact with the conscious victim. It is best to stay on firm ground and to avoid entering the water, which may add to the risks of the rescue.

The unconscious victim in shallow water should be assessed as soon as possible and, if there is no normal breathing, rescue breathing should be started immediately — see, **Resuscitation in water**.

If the victim needs resuscitation, an immediate retrieval from the water is vital because it is impossible to give effective CPR in the water — see **Resuscitation**.

Many water rescues may be for the victim of a potential spinal injury, e.g. resulting from jumping off a jetty into shallow water or striking a submerged object in a river. If a spinal injury is a possibility the victim should be supported in the water and towed by the head until a rescue team is available — see **Spinal injuries**.

After rescuing a person from water it is important to wrap the victim's head, neck, trunk and limbs in a warm blanket to maintain body heat and avoid the onset of hypothermia — see **Cold illness**.

Any person who has been rescued from water should have a medical assessment as soon as possible, even if there are no symptoms and signs of illness resulting from the immersion. Late complications are common after an immersion incident and a young child is particularly vulnerable.

## Road accidents

Whether a driver, passenger or pedestrian, the victim of a road accident is often seriously injured and in need of urgent medical assessment and treatment. The first aider might be the first person on the scene and may be influential in saving a life before the arrival of ambulance personnel. Anyone involved in the accident might also need support although there may be no obvious injuries. The driver of a car that has hit a pedestrian or cyclist will be most distressed and may even suffer a heart attack from the severe stress.

### Motor vehicle accident victims

Whatever the circumstances, the first aider must ensure safety for self, victim and bystanders. This may involve obtaining help to make the area safe before approaching the victim, or simply asking a bystander to use hazard lights to warn oncoming traffic of the emergency scene ahead.

On reaching a vehicle at an emergency scene, the first aider should:

- check that the ignition key is turned off and do this if necessary
- put the vehicle in gear and with the handbrake on for safety
- warn bystanders not to light a cigarette in case there is any leaking fuel.

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# Road accidents cont.

There are serious risks in trying to assess and treat an accident victim on a roadway or where there is traffic. If the victim is lying on the road or in a position of danger from oncoming traffic, use one of the dragging methods to reach a safer location — see **Moving a sick or injured victim**.

Unless the victim appears to be uninjured, ensure that a bystander makes a prompt call to **000** or mobile 112 for an ambulance.

If unconscious, turn the victim onto the side immediately and be prepared to commence CPR if necessary — see **Resuscitation**.

If there are any bleeding wounds, apply prompt pressure and elevation while assessing any other injuries — see **Bleeding**.

When a person appears to have extensive injuries and is still seated in a vehicle, it is best to avoid movement of any nature unless it is essential for the victim's wellbeing. For example, when a person becomes unconscious it is advisable to remove the victim from the vehicle to ensure adequate protection of the airway.

If a person is trapped in a seat by extensive damage to the vehicle, assess and manage the victim as outlined for any trapped person — see **Trapped victims**.

## Motorcycle accident victims

A person who is involved in a motorcycle accident may receive multiple injuries and may have a potential spinal injury from hitting the road head first.

The first step is to ensure safety for the first aider, victim and any bystanders. Unless the area is safe from traffic hazards, the victim must be moved promptly by one of the dragging methods — **see Moving a sick or injured victim**.

Once in a safer area a full assessment and first aid treatment should be carried out following the **Basic Life Support Flow Chart**. All other first aid should be given as outlined on the relevant pages of this handbook.

If the victim is unconscious it may be necessary to remove the rider's helmet to gain access to the airway. Initially, if there is no response, the victim should be rolled onto the side for airway care. If a detachable visor is present, it should be quickly removed to permit access to the mouth and nose area. If a chin strap is present it should be undone or cut through to allow access to the mouth and lower jaw.

The helmet may still provide protection to the victim's head and the first aider must assess the need to remove it. If the victim is breathing with a clear airway, it may be possible to leave the helmet in place until the arrival of the ambulance.

If the victim is **not breathing normally** it is essential to remove the helmet to allow rescue breathing and CPR to be given.

### Removal of the helmet

To remove the helmet it is best to have two people available, one to steady the head and neck and the other to gently remove the helmet.

However, if there are no bystanders the first aider must carry out the manoeuvre without help as follows:

- The sides of the helmet must be pulled outwards to loosen the moulded grip over the ears.
- While keeping the two sides apart, the helmet should be tilted upwards to free the point of the chin, avoiding any movement of the head and neck.
- The helmet is tilted forwards to lift it over the back of the head and off the face, again without undue movement of the head and neck.

If the victim is conscious the first aider must be guided by the rider's wishes and assist if necessary in removal of the helmet. If the victim is nauseated or likely to vomit the helmet should be removed at an early stage.

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## Chemicals

Chemical spills may occur in certain workplaces or on the road following a tanker collision or rollover. If there is a Hazchem sign on the tanker, quote the Hazchem code when calling for assistance. As a general rule the first aider should stay well clear of any chemical and, in the workplace, trained safety personnel should deal with the hazard quickly and effectively according to standard operating procedures.

Where chemicals are used there should be a Material Safety Data Sheet (MSDS) for each one and all workers in that area should be familiar with it. If an ambulance is required after a chemical injury the ambulance crew members should be given a copy of the MSDS.

When giving first aid treatment to the victim of chemical burns the first aider should be careful to avoid contamination from the victim's skin or clothes. If there is a water shower unit nearby, the victim should be showered fully clothed and contaminated items removed under the protection of running water to dilute the chemical.

With the exception of hydrofluoric acid, no attempt should be made to use a specific neutralising solution for acid or alkali burns because it may well cause further tissue damage. A chemical burn should be flushed with running cold water for up to 30 minutes. The treatment may be continued until the arrival of an ambulance.

For a hydrofluoric acid burn, calcium gluconate gel should be readily available as a neutralising agent wherever this chemical is used. The gel should be applied as soon as possible either by the victim or the first aider wearing heavy-duty industrial gloves — see **Burns**.

If the chemical is in powder or crystal form, e.g. powdered chlorine, wear heavy-duty industrial gloves to brush any particles off the skin before using cool, running water to neutralise the remaining chemical. Phosphorus is especially dangerous and may suddenly ignite. To avoid this additional hazard, the first aider should try to keep the area wet and pick off any visible particles under water using a pair of forceps rather than gloved fingers — see **Burns**.

## Fire or toxic fumes

When fire complicates an emergency, the first aider should be conscious of the danger and the serious risks of going into a burning room or building. Home fires are associated with the release of toxic fumes from furniture made of synthetic products. Entry into a place where there is dense smoke or toxic fumes is most unwise and may result in the loss of another life. Fire officers will generally use breathing apparatus to give protection from smoke or fumes and the first aider should make sure that the emergency services have been called and wait for such trained assistance to arrive.

If caught in a smoke-filled area, the first aider should drop to the floor and attempt to crawl to safety. If a victim has collapsed in the area, use one of the dragging techniques for the rescue — see **Moving a sick or injured victim**.

If smoke or toxic fumes overcome the victim, make a rapid assessment of the victim and be prepared to carry out CPR if necessary — see **Resuscitation**. If the victim has inhaled any smoke or toxic fumes, the mouth, throat and lower airways may have been burned. Look for signs of burning, e.g. singed hairs inside the nose or a hoarse voice — see **Burns**.

Sometimes a victim may be found with clothing on fire. The immediate response should be to get the victim to floor level and wrapped in a cotton or wool blanket to extinguish the flames. The best advice to follow is to Stop, Drop and Roll to extinguish the flames and avoid any further injury.

Once the flames have gone out, quickly check the victim for any burns and give appropriate treatment — see **Burns**.

Ensure prompt medical assessment to avoid serious complications occurring later.

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# Emergency procedures

## Moving a sick or injured victim

As a general rule it is important to avoid moving any sick or injured victim because of the risks of causing complications to the underlying condition. Obvious exceptions to this rule include turning an unconscious person onto the side for airway management, or moving a person from life-threatening danger to a safer location, e.g. from the middle of traffic to the roadside.

A first aider is wise to avoid lifting a person off the ground, even with bystander assistance, because such an action is likely to move bones and muscles out of their current alignment. The safer alternative is to drag the victim in the long axis of the body, using either the arms or the legs for traction, thus maintaining body alignment. The only safe lift for first aid is the Blanket Lift for which a minimum of six people and preparation time are needed.

**The safest first aid methods of moving a victim are as follows.**

### Leg Drag Method

This is the preferred method where there are no obvious lower limb injuries.

Crouching low, the first aider grips the victim's ankles firmly and, leaning back, allows body weight to drag the victim to safety.

### Arm Drag Method

The first aider should use this method when there are obvious lower limb injuries.

Crouching low, the first aider should pull the victim's arms above the head and grip the elbows if possible. The elbows should be held in firmly against the victim's head to give support and prevent the head from dragging on the ground during the move.

If it is impossible to hold the arms against the head, a wrist grip should be used. Again the first aider should crouch low and grip both wrists firmly, leaning back to use body weight to drag the victim to safety.

### Clothing Drag Method

If the victim has multiple injuries, it may be best to use clothing for the drag to avoid direct traction on the body. However, there are additional risks with this method because clothing may suddenly tear and create a whiplash effect on the victim. Where possible it is always best to use one of the body contact methods outlined above to reduce the risks of moving the victim.

To use the clothing drag the first aider needs to have a firm grip on clothing that is pulled up firmly under the armpits. A coat or jacket will be better than a woollen sweater, which may not take the victim's body weight. The first aider then crouches down low and leans back while pulling firmly on the clothing.

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## Blanket Lift

This method is safe only when there is a minimum of six bystanders present, plus a strong blanket long enough to support the victim's entire body. It is not a suitable method for an emergency when life-threatening danger is present, but it may be useful in a remote area where there is likely to be a significant delay before the arrival of trained personnel. In this situation it is designed to assist in the transfer of a sick or injured person out of extreme weather conditions.

First the blanket must be rolled up along its length until only half of the blanket is left flat on the ground. The rolled edge is then placed along the victim's side, making sure that the blanket will support both the feet and head.

Next the three helpers on the opposite side roll the victim onto their knees using a "log-roll" technique in which the victim's head, neck, spine, hips and legs are kept in a straight line throughout. The rolled edge of the blanket is then placed close to the victim's spine and the victim gently eased back onto the ground.

The victim is then "log-rolled" flat to allow the blanket roll to be pulled out, leaving the victim lying centrally on the blanket. Three helpers should stand on each side and roll up their side of the blanket into a tight roll held close to the victim's body. The first person on each side should grip the blanket roll with one hand close to the victim's ears and the other at shoulder level.

The middle person on each side should grasp the blanket roll at mid-chest level and close to the victim's hips. The third person on each side should grasp the blanket roll with one hand close to the victim's thighs and the lower hand close to the victim's feet.

When the most highly trained person present is satisfied that the lift will be safe, the lifters are told to lean outwards slightly to keep the blanket tightly stretched and the order is given to "lift slowly".

The lifters then face forwards and walk slowly to the planned location. It is vital that the lifters are told to avoid walking "in step" because this would cause the victim to rock from side to side. Once the new location has been reached, the order is given to lower the victim, slowly and carefully.

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## Trapped victims

There are situations where a victim may be trapped and requires rescue by emergency personnel with special training and equipment. For example:

- a person trapped in a car needing a rescue team with the "Jaws of Life" cutting equipment
- a person in a workplace who is trapped in a confined space and needs rescue by an individual who holds a "Confined Space Entry Permit".

There are several actions that a first aider can take to maintain life until a full rescue can take place. The first aider should try to carry out the standard assessment and management techniques outlined earlier in this handbook. The following are examples of a modified approach.

### Unconscious victim

If unconscious, try to clear and open the victim's airway in the position found. If in a motor vehicle where the victim is held in a vertical position by a seat belt, leave the seat belt in place to stabilise the victim. Support the head while the airway is cleared and opened using head tilt and chin lift to support the jaw. Either support the head from behind, or through the side window if this is easier.

*Victim not breathing*

If not breathing normally, it may be possible to give rescue breathing if the first aider is able to seal the victim's mouth and nose from any achievable position. It is not possible to give effective CPR unless the victim is lying flat on a firm surface.

*Bleeding victim*

If the victim is bleeding and it is impossible to secure a dressing in place with a bandage, the first aider should hold the pad in place with firm hand pressure until trained assistance is available.

## Care of a victim in a remote area

An emergency in a remote or isolated area presents a special challenge to the first aider, although it is rare for the individuals involved to be without either a satellite phone or access to the Royal Flying Doctor Service (RFDS). When people are working in remote areas, e.g. mining engineers or surveyors, detailed plans and guidelines are generally available for managing any emergency. Such plans include:

- communication st ategies to notify the nearest assistance (it is customary for an employer to have arranged RFDS cover in advance)
- provision of a RFDS medical kit, which contains a wide range of medications and first aid equipment.

All that is required in an emergency is telephone contact with the nearest RFDS base station.

### Radio link

If the RFDS radio link is used, there will be ongoing advice and feedback from that service and the first aider will not feel so isolated. There may be a temptation to drive the sick or injured person out of the area in an attempt to get help as soon as possible. It is rarely wise to undertake such an evacuation because of the real risks of further complications occurring during transport. Most victims are best left in one place until help arrives.

If there is no radio or telephone contact from the emergency scene, it is best to identify a person who is available to drive to the nearest town or village and arrange for a rescue team to arrive. However, each situation must be judged on its merits and it is rarely wise for one of only two people to leave the emergency scene to fetch help unless no other arrangements are possible. The first aider may need help with adjusting the victim's position and if resuscitation is suddenly needed, a second person can be invaluable.

### Longer term care

The main difficulty faced by a first aider in a remote or isolated area is the likely time delay before the arrival of highly trained help. It often becomes necessary for the first aider to maintain care of the victim for several hours before help arrives.

The following aspects of care are additional to the specific first aid treatments outlined in this handbook.

*Unconscious victim*

If the victim is unconscious, positioning is as for any other unconscious person. The first aider should begin CPR promptly if normal breathing stops — see **Resuscitation**.

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# SKILLS AND PROCEDURES

### *Conscious victim*

- Make the victim comfortable
- Position the victim carefully to avoid unnecessary movement that may cause further complications. The victim can choose the position of greatest comfort and the first aider should then provide clothing or bedding materials to take the pressure off the bony parts of the body. Depending on the position adopted by the victim, this may include the back of the head, shoulders, elbows, buttocks and heels.

### *Shelter the victim*

If it is necessary to move the victim into a sheltered area to avoid extremes of heat or cold, do this promptly and carefully, provided that the move will not cause additional pain or injury to the victim. The surface on which the victim will rest may need to be protected by insulated material plus a blanket for additional comfort. It may be necessary to provide an additional blanket on top to maintain body heat, or items of clothing may be used.

### *Change victim's position*

Consider changing the victim's position if there is likely to be a delay of two or more hours before a retrieval team arrives. Pressure must be taken off the main contact points of the body, which may be achieved by simply allowing the victim to turn from the back to the side or from one side to the other. Much will depend on the underlying illness or injury and care must be taken to avoid any unnecessary risks caused by moving the victim from one position to another.

### *Maintaining a safe fluid balance*

Maintain an adequate circulation through the provision of fluids if there is to be a significant delay before the arrival of a rescue team. Note that the first aid care of most injuries will include a strong warning about giving any food or fluids because of safety risks if an anaesthetic or surgical procedure is needed. In hot or remote conditions this caution must be balanced against the risk of dehydration.

The victim should be offered frequent small sips of cool fluids because the condition of shock will make it difficult for a victim to absorb any larger volume of fluids. Avoid hot fluids because they will cause a rapid increase in circulation to the stomach, which will divert blood from other areas of the body.

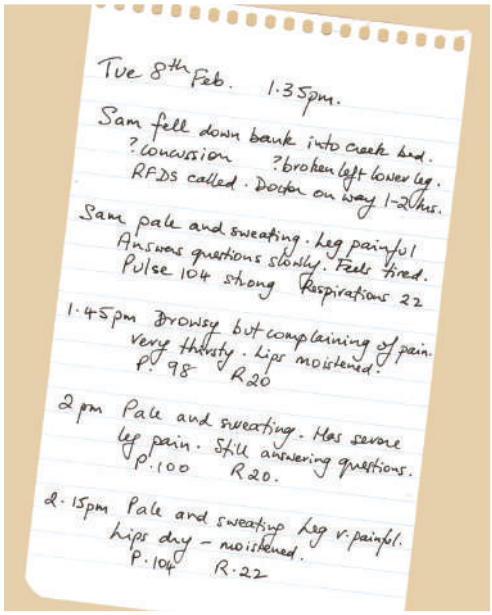
Measure and record all fluids given so that the total amount can be advised to the retrieval team. This will be easier if a known amount of fluid is poured into a small container from which sips can be given, e.g. a cup or mug, which generally holds 250ml.

### *Measure fluid output*

Assist with the elimination of urine or faeces, although the latter is unlikely in the presence of severe illness or injury. If urine is passed it should be collected into a suitable container, preferably glass or plastic, with a lid that can be secured. It is important to measure any urine passed to ensure that a similar replacement volume is given. Keep any urine in case the rescue team needs to test it to assist with an early diagnosis. For example, the presence of any blood or dark discolouration may be a guide to the degree of internal injury.

### *Assess and record the vital signs*

Assess and record the victim's vital signs at frequent intervals and at least every 15 minutes — see **Vital signs**.


Tue 8th Feb. 1.35pm.
Sam fell down bank into creek bed.
?concussion ?broken left lower leg.
RFDS called. Doctor on way 1-2hrs.
Sam pale and sweating. leg painful
Answers questions slowly. Feels tired.
Pulse 104 strong Respirations 22
1.45pm Drowsy but complaining of pain.
very thirsty. Lips moistened.
P. 98 R 20
2pm Pale and sweating. Has severe
leg pain. Still answering questions.
P. 100 R 20.
2.15pm Pale and sweating leg v. painful.
lips dry - moistened.
P. 104 R. 22

The first aider should also:

- record any additional symptoms or signs that may occur during the hours following onset of the problem
- ask the victim if the e are any changes in sensation that should be noted
- check any dressings, bandages or splints on each occasion to ensure that wounds are still covered, bleeding controlled and bandages firm but not too tight.

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# Multiple victims

Sometimes the first aider is faced with the need to assess and treat more than one victim. Although bystanders may be available to assist, the first aider will need to:

- check whether any of them have current first aid training
- supervise any first aid that is being given in case the victim's condition is made worse.

## Setting emergency care priorities

Triage is the method used to sort sick and injured victims into priorities according to their first aid needs. This method follows the standard priorities of the **Basic Life Support Flow Chart.**

Any person suffering from airway or breathing problems must take priority over the care of a person with a less serious condition, e.g. a distressed victim with a crushed foot who is shouting out with pain.

### 1. Top priority is always given to:

- Airway obstruction possibly resulting from severe facial injuries, airway burns etc
- Breathing difficulties possibly resulting from chest injury or the inhalation of smoke or fumes
- Circulation problems associated with chest pain, severe blood loss or circulatory collapse due to severe shock
- Major burn or scald injury, especially where more than 20% of the body is involved.
- Major injuries of the head, chest or abdomen
- Uncontrolled bleeding
- Unconsciousness

### 2. Second priority is given to:

- Burn or scald injury involving less than 20% of the body surface
- Closed abdominal injury, e.g. abdominal pain without any wound
- Closed head injury, e.g. concussion or altered level of consciousness
- Open fracture, e.g. where there is a wound over the bony injury

### 3. Third priority is given to:

- A major fracture
- Eye injury
- Hand injury
- Spinal cord injury

Less serious conditions must wait for treatment until all the above priorities have been met. It is important to reassess all individuals on a regular basis to note any changes that might have occurred, especially where there is any deterioration since the previous check.

The assessment and management of the above conditions are found under the A – Z Index of topics in this handbook.

## After the emergency

When trained help has arrived and the victim is being treated professionally, the first aider may feel a little lost. During the emergency, a flow of adrenaline allows the first aider to move quickly and remain detached from everyday concerns. Once trained personnel accept responsibility for care of the victim, the adrenaline flow returns to normal.

Suddenly the first aider may feel a sense of tiredness with various aches and pains, especially if CPR was given. The first aider also may feel:

- confused about what to do next when the victim has been taken to hospital.
- a sense of satisfaction if the victim is alive as a result of the first aid given.
- anxious, depressed or even tearful, especially if the victim is seriously injured or has suffered a massive heart attack.
- an awareness that something was overlooked or a treatment left undone, causing a sense of personal failure.
- anger or frustration that first aid is suddenly no longer needed.

### Coping mechanisms for stress

The first aider may recognise signs of personal stress including irritability, flashbacks, disturbed sleep or a feeling of withdrawal from family, friends and work colleagues. If the first aider regularly practises yoga or meditation, then these may be used to reduce stress levels and allow the first aider to refocus on everyday life. If the symptoms of stress do not go away in a matter of hours or overnight, the first aider should seek medical advice. When the victim is a close colleague or family member, or when a group of personnel provide a team response to a workplace emergency, it is important to have a debriefing or evaluation session guided by a health professional. Post-traumatic stress affects people in different ways and sometimes ongoing professional help is needed.

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# Infection control in first aid

When giving first aid to a sick or injured person you should try to minimise the risks to yourself, the victim and any helpers or bystanders.

## Ten basic rules for first aid

1. When possible, wash your hands with soap and water and apply disposable latex gloves before touching a wound, blood or other body fluids.
2. In the case of serious bleeding, where there is no time to obtain or apply gloves, it is possible to control the blood loss without having any direct contact with blood — see **Bleeding**.
3. If you have any cuts or wounds on your hands, ensure that they are fully covered by a waterproof dressing before applying gloves.
4. Keep your face turned away during any treatment to avoid inhaling droplets of a potentially serious infection, e.g. tuberculosis.
5. If you are splashed with blood or other body fluids, wash the area thoroughly with soap and water as soon as possible. Then contact your doctor for specific medical advice.
6. If any of your clothing has been contaminated by body fluids, remove it promptly and immerse it in a container of laundry soaker, mixed according to and following the instructions on the label.
7. Safely dispose of any used dressings, bandages and disposable gloves into a plastic or paper bag, sealing it well before putting it into a rubbish bin with a well-fitting lid.
8. If there is a hospital or medical clinic nearby, the dressings can be disposed of into a medical Hazardous Waste bin where they will be treated correctly and incinerated.
9. Used instruments, such as scissors or splinter forceps, should be cleaned thoroughly under running cold or warm water. Serrated edges should be scrubbed with a fine nailbrush under running water. The articles should then be disinfected by an approved method. Preferably by immersion for two minutes in 70% Alcoholic Chlorhexidine or 30 minutes in a 1:80 bleach solution.
10. After removing disposable gloves always wash your hands thoroughly with soap and water. Dry your hands well to avoid cracking of the skin.

## Rules for wound care

Wash your hands and always apply disposable gloves unless life-threatening bleeding is present — see **Bleeding**.

A wound containing dirt or other contaminants should be cleaned with either an antiseptic solution or soap and water.

The wound should be dried thoroughly before the dressing is applied.

Avoid direct finger or hand contact with the wound or the central part of the sterile dressing.

Apply a light dressing to the wound and secure it with a bandage or tape.

If the dressing is accidentally dropped or slips off the wound, apply a fresh one at once.

If the wound has any obvious discharge present, use an absorbent dressing on top of the first sterile dressing and bandage it in place firmly.

After securing the wound dressing, remove your gloves and wrap them with any soiled dressings and put them in a plastic or paper bag. The bag should be placed in a covered disposal bin or in a Hazardous Waste container.

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# Dressings and bandages

A dressing is used to protect a wound and prevent infection, but also to allow healing to occur underneath the dressing. A dressing should be large enough to totally cover the wound, with a safety margin of about 2.5cm on all sides beyond the wound. A sterile dressing may be used to control bleeding from a major wound or to absorb any discharge from a minor wound.

Dressings vary greatly in nature and size, so it is important to select the correct dressing for use on a specific wound.

A bandage is used in combination with a dressing where a wound is present. A roller bandage is used to secure a dressing in place or to slow the absorption of venom into the body after a snake or spider bite. A triangular bandage is used as an arm sling or as a pad to control bleeding. It may be used to support or immobilise an injury to a bone or joint or as improvised padding over a painful injury. A tubular gauze bandage is used to retain a dressing on a finger or toe.

## Dressings

### Sterile wound dressings

Wound dressings will be in a sterile packet, which should be opened carefully by a person with clean or gloved hands. Then, to avoid contamination of the sterile dressing, it is not removed from the opened packet until the wound is ready to be covered.

Dressings used to control bleeding must be bulky to ensure that adequate pressure is applied over the injured area. The most common dressing is made of combined wool or cellulose, covered in a light cotton woven fabric and they are generally known as "Combine Dressings".

Some major wound dressings are labelled as BPC (because they are listed in the British Pharmacopeia) and consist of a sterile combine dressing with attached bandage. They are ideal to fill crater wounds or to control severe bleeding — see **Bleeding**.

Sterile gauze squares are used mainly for cleaning a wound because of loose cotton fibres that might stick to the wound during healing.

### Sterile non-adherent dressings

Very light dressings are used to aid healing on a minor wound and most have a non-adherent surface. A non-adherent dressing is often covered on one or both sides with a plastic film containing many perforations. If only one side has a plastic film, that is the side to be placed against the wound. This allows fluids to pass through into an absorbent layer, to keep the wound dry.

Other types of non-adherent dressing have a special synthetic coating on one or both sides to prevent adhesion to the wound surface. The non-adherent layer is always placed against the wound. To reduce confusion and incorrect use, some manufacturers make both sides non-adherent.

Non-adherent dressings are used for extensive surface wounds such as an abrasion (graze) or burn — see **Bleeding** and **Burns.**

For a major burn or scald, a special burn dressing known as "tulle gras", which is an open weave dressing coated with sterile jelly, may be used. These have the advantage of staying moist for 24 to 48 hours, which can reduce pain from the injury and are easier to remove and change.

### Adhesive strip dressings

An adhesive strip dressing may protect minor wounds and some are especially shaped for the knuckle, heel, finger tip etc. An adhesive dressing should not be left in place for more than 24 hours without being removed to allow the wound to dry. If necessary, a fresh adhesive dressing may be used if the wound is not fully healed or where protection from clothing is needed. A plastic adhesive dressing should be used only for short periods of time to protect against moisture or grease. If not replaced every day with a porous fabric dressing, the wound may break down, taking longer to heal or becoming infected.

A special adhesive dressing coloured blue is used by cooking and catering personnel because it is X-Ray detectable and easily found when food items are scanned.

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## Improvised dressings

In an emergency a dressing may be improvised from a range of materials. To control bleeding a bulky pad may be made from a bundle of several facial tissues or from any clean, non-fluffy material.

For a minor burn or scald, a piece of clean plastic kitchen film may be used initially. However, if the burn is serious, it is vital to use only sterile coverings to avoid the risk of infection. Cooling should be continued until a sterile dressing is available — see **Burns**.

# Bandages

Roller bandages vary greatly depending on how they are to be used.

A roller bandage is used to:

- hold a dressing in place on a wound
- maintain pressure over a bulky pad to control bleeding
- support an injured limb or joint
- apply pressure to a limb after a venomous bite.

Roller bandages are made from lightweight cotton, crepe or elasticised crepe, depending on the pressure to be achieved. A lightweight cotton bandage is used to hold a dressing in place, whereas a crepe or elasticised crepe bandage is used for the Pressure Immobilisation Bandaging Technique following a snake or Funnel Web spider bite — see **Bites and stings**.

## Applying roller bandages

A roller bandage needs to be chosen carefully to ensure that it is the correct width for the body part involved. As a general guide, the following widths are recommended:

- Lower arm, elbow, hand and foot – 75mm
- Upper arm, knee and lower leg – 100m
- Large leg or trunk – 150mm

It is best to use a bandage with some degree of stretch in the weave. This will make the bandage easy to use and more likely to stay in place for many hours. However, the correct application technique is essential to provide comfort and adequate support for the affected part.

### Basic steps to successful use of a roller bandage

- Bandage the part in the position of greatest comfort to the victim. Support the part adequately before starting to apply the bandage.
- Hold the tightly rolled bandage with the "head" of the bandage on top and wrap the "tail" around the body part without unrolling more than a few centimetres at a time.
- Begin with a locking turn to hold the start o the bandage securely under each following turn.
- Work from the middle of the body or limb in an outwards direction.
- Work from the narrowest part below the dressing and work upwards.
- Ensure that each turn covers two-thirds of the previous turn.
- Cover totally any dressing and padding used.
- Finish with a straight turn at the end of the bandage.
- Secure the bandage with a safety pin or adhesive tape. Avoid the use of metal clips because they are less secure and can fall out during activity.
- After finishing the bandage, check the circulation in the fingers or toes. Compare both arms or both legs to detect any change in colour that would indicate the bandage is too tight. If the tissues on the affected side appear blue-tinged or white, or if the victim complains of any numbness or tingling, loosen the bandage immediately and re-check the part frequently until a normal colour is achieved.

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### Applying a roller bandage to the lower arm or leg

- Apply a dressing or padding over the affected area.
  Start with a diagonal, locking turn below the dressing or padding to secure the dressing.

- Continue up the limb, covering two-thirds of each previous turn.
- Finish with a straight turn to secure the bandage and fasten it with a pin or adhesive tape.

### Applying a roller bandage to the elbow or knee

- Apply a dressing or padding over the affected area.
- Start with a full turn over the point of the elbow or knee to secure the bandage.

- Make a second turn just below the first, exposin one-third of the initial turn over the point of the elbow or knee.

- Make a third turn just above the first, again exposing one-third of the initial turn over the point of the elbow or knee.
- Continue with one or two more turns alternately working from below to above the affected joint, until the dressing or padding is fully covered. Avoid any extra turns that will cause pressure on the inside surface of the joint.
- Finish with a full turn above the elbow or knee and secure the bandage with a safety pin or adhesive tape.

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## Applying a roller bandage to the hand or foot

- Apply a dressing or padding over the affected area.
- Start with a diagonal, locking turn around the wrist or foot.
- Carry the bandage across the back of the hand to the base of the little finger or little toe and then make a complete turn around the fingers or toes.

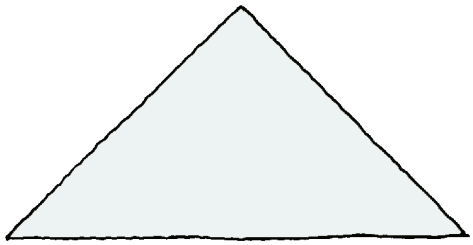
- Make another turn across the back of the hand or foot from the fingers/toes to the wrist/ankle.
- Repeat these turns working upwards with each turn until the dressing or padding is covered.
- Finish with a circular turn around the wrist/ankle and secure the bandage with a safety pin or adhesive tape.

## Applying a triangular bandage

Triangular bandages are usually made from a metre square of cotton or calico that is cut in half diagonally. The bandage can be used in various ways as a sling or for immobilisation of broken bones and soft tissue injuries.

### Sling

- In the open form as a sling to support an upper body injury.



### Broad-fold bandage

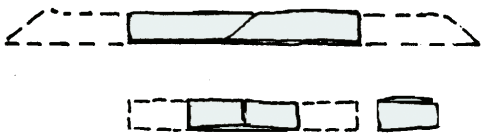
- As a broad-fold bandage with the apex folded down to the base twice to immobilise a lower body injury.

### Narrow-fold bandage

- As a narrow-fold bandage with the broad-fold bandage folded in half to control severe bleeding, or for immobilisation of a lower limb.
- As a collar-and-cuff sling for an upper body injury.

### Pad

- As a folded pad after the ends of the narrow-fold bandage have been brought into the centre three times, and for use on a major wound or as padding when immobilising bandages are applied.



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# SKILLS AND PROCEDURES

## Tying a reef knot with a triangular bandage

When using a triangular bandage it is important to use a reef knot to secure it in place. A reef knot is a flat knot that will not slip undone and, if correctly placed on the body, it is comfortable for the victim.

**1** Wrap the left end of the bandage over and then under the right end to start the knot.

**2** Wrap the right end over and then under the left end to complete the knot.

**3** Pull the knot tightly from both sides to ensure that it will lie flat.

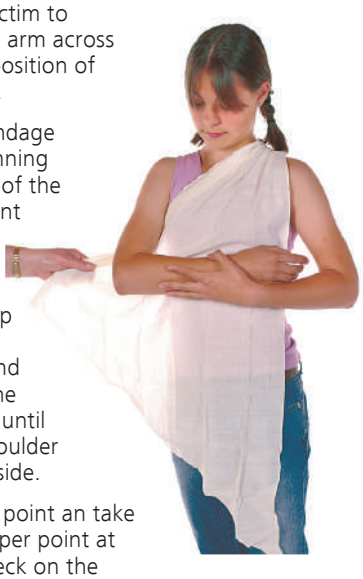
## Untying a reef knot

It is easy to untie a reef knot without jarring or hurting the victim. Simply choose two paired ends as they come out of the knot at one side. Then pull the ends apart steadily until two loops form and can be slipped off one end.

## Arm sling

This sling is used to support a lower arm or hand injury and for rib or collarbone fractures.

- Encourage the victim to hold the affected arm across the body in the position of greatest comfort.
- First hold the bandage with the base running down the centre of the body and the point to the elbow on the affected side. Gently slip the top point under the supported arm and wrap it around the back of the neck until it rests on the shoulder of the **affected** side.



- Lift up the lower point an take it to meet the upper point at the side of the neck on the **affected** side.
- Use a reef knot to tie the ends together just above the collarbone to avoid any pressure on the back of the neck.
- Adjust the sling so that the finger tips are clearly visible and then bring the point forward and fasten it to the sling with a safety pin.

- Finally, check the circulation in the fingers and compare the tissue colour with the finger tips on the unaffected arm. If there are any signs of an impaired circulation, loosen or remove the sling and any underlying bandages.

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## Elevation sling

This sling is used for an arm or finger injury where the victim needs the hand and arm to be held in an elevated position.

- Encourage the victim to hold the affected arm across the body with the fingers pointing to the opposite shoulder tip.
- First hold the bandage with the base running down the centre of the body and the point to the elbow on the affected side. Gently place the bandage over the supported arm and carry the top end around the front of the neck until it rests on the **unaffected** shoulder.

- Gently wrap the lower half of the bandage along the affected arm. Carry the free end of the bandage from the elbow across the back to the opposite shoulder tip.
- Gently twist the to point around the fingers, but avoid placing pressure on any injury. Tie the two ends together with a reef knot and place it just above the collarbone to avoid any neck pressure.

- At the point of the elbow smooth the loose fabric forwards along the arm under the sling. Secure the sling firmly at the elbow with a safety pin.
- Finally, gently open the top of the sling to check the circulation in the fingers. Compare the tissue colour with the finger tips on the unaffected arm. If there are any signs of an impaired circulation loosen or remove the sling and any underlying bandages.

## Collar-and-cuff sling

This sling is used to hold the lower arm and hand in an elevated position where a full elevation sling is either not required, or for victim comfort in very hot weather. The sling is made with a narrow-fold bandage used as a clove hitch.

- Make a clove hitch with two large loops of the bandage. One loop is made with the bandage end pointing upwards and the other end pointing downwards.
- Fold the two loops inwards towards the middle, ensuring that both ends are trapped between the loops.

- Encourage the victim to hold the affected arm across the body with the fingers pointing to the opposite shoulder tip. Then gently slide the two loops over the hand and lower arm with the ends hanging downwards.
- Carry the two bandage ends up on either side of the limb and around the victim's neck. Adjust the bandage so that it is possible to tie a reef knot just above the collarbone on one side to avoid any pressure on the neck. The knot may be placed on either side of the neck depending on the location of the injury and the comfort of the victim.
- Finall , gently check the circulation in the fingers. Compare the tissue colour with the finger tips on the unaffected arm. If there are any signs of an impaired circulation, loosen or remove the sling and any underlying bandages.

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# Systems of the human body

## The respiratory system

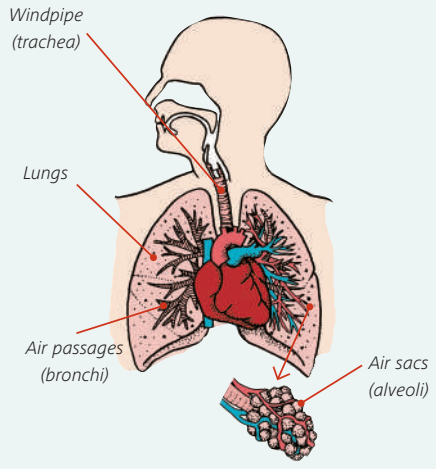
Air enters the body through the mouth and nose where it passes over mucous membranes and is moistened. Air then flows down the trachea (windpipe) and enters the lungs through a tree-like structure of airway tubes. At the end of each small tube (bronchiole) is a cluster of air sacs called alveoli.

The lowering of the diaphragm and relaxation of the muscles of the chest wall causes air to be drawn into the lungs. When the diaphragm moves upwards and the chest muscles tighten, the total capacity of the lungs is reduced and air moves out of the lungs into the atmosphere.

Blood is pumped from the heart to the alveoli where oxygen is exchanged for carbon dioxide and other waste gases, which are then exhaled.

### Average breathing rates

| | |
|---|---|
| Adults | 10–20 breaths per minute |
| Children | 20–28 breaths per minute |
| Babies | 28–40 breaths per minute |




## The heart and circulation

Blood flows continually around the body in a vast network of blood vessels. The heart is the pump that drives blood through the arteries, which carry blood rich with oxygen to all organs and tissues. The oxygen is exchanged for carbon dioxide in a network of capillaries before the oxygen depleted blood returns to the heart and lungs through the veins.

Arteries have thick muscular walls to maintain the blood pressure within the circulation, but veins have thinner walls and a series of internal valves to assist the flow of blood back to the heart and lungs.

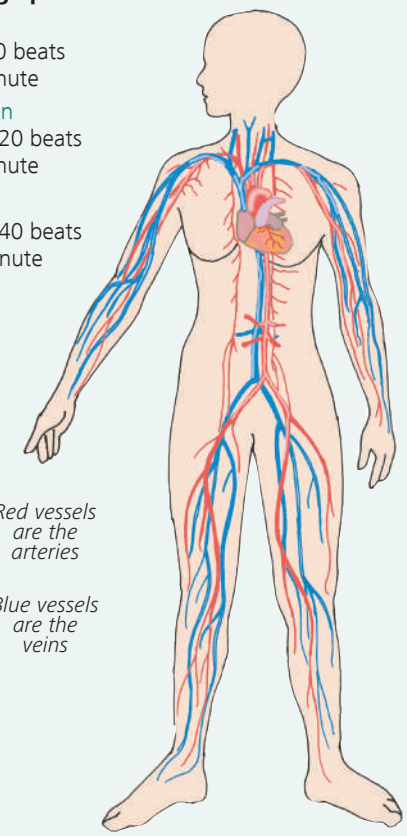
A smaller circulation system exists between the heart and lungs where carbon dioxide is removed in the alveoli and oxygen added to the blood in readiness for the next circuit around the body.

### Average pulse rates

Adults
60 – 90 beats per minute

Children
100–120 beats per minute

Babies
120–140 beats per minute

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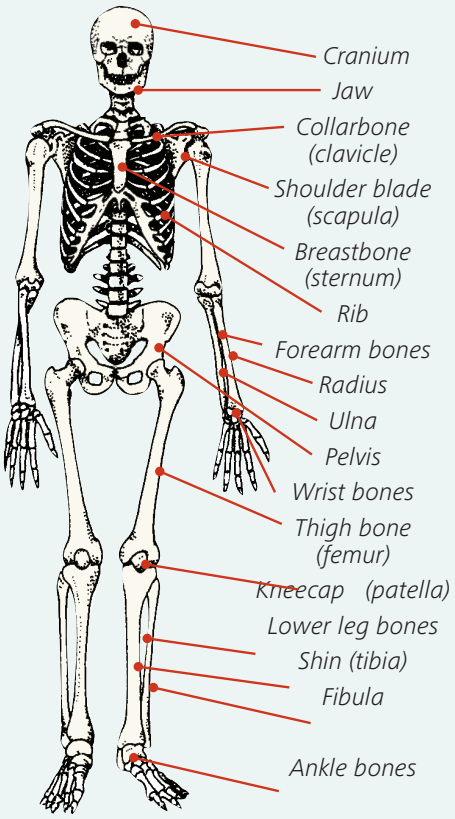
## The skeleton

The skeleton forms the bony framework of the body through a collection of around 200 bones. Movement occurs through muscles, tendons and ligaments, which give the body flexibility at joints. These joints include:

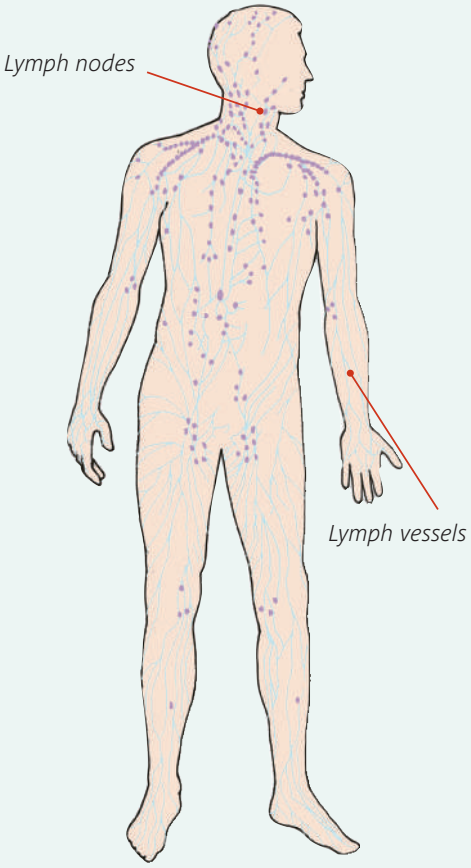
- fixed joints where bones are fused together, e.g the skull
- ball and socket joints for a large range of movement, e.g the shoulder and hip
- hinge joints for limited movement in one plane, e.g the elbow and knee
- slightly moveable joints for some flexibility, e.g the spinal vertebrae and ribs




## The lymphatic system

The lymphatic system consists of a vast network of fine vessels that transport lymph throughout the body. The tonsils and spleen are two of the lymphatic organs. Lymphocytes are blood cells that are made as part of the body's defence system. When infection occurs, additional lymphocytes are made to help fight the infection and lymph nodes (often called glands) become swollen in the neck, armpit or groin.

When toxins enter the body, e.g. from snake or spider bite, the lymphatic system carries the foreign material from the entry site for destruction in the liver.

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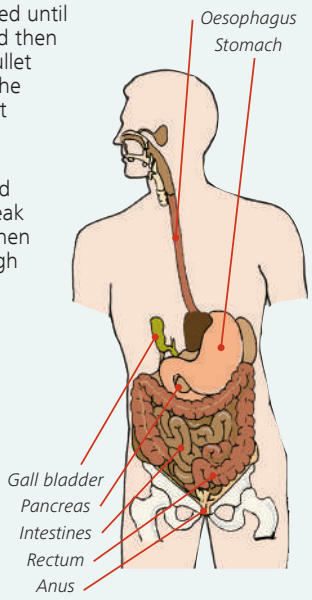
## The digestive system

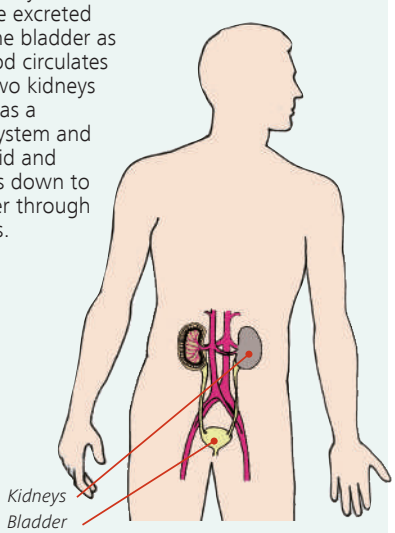
The digestive system is a collection of organs and tissues that process the food that we eat. Food enters the mouth, is chewed until safe to swallow, and then moves down the gullet (oesophagus) into the stomach for the first stage of digestion.

After mixing with various enzymes and stomach acid to break down the food, it then moves down through the small and large intestines where fluid and nutrients are absorbed into the circulation. The remaining waste material is collected in the rectum and leaves the body through the anus as faeces.




## The urinary system

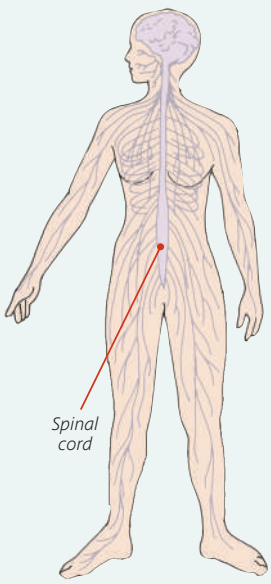
The urinary system is responsible for the maintenance of fluid balance by removing surplus fluid and waste from the body to enable them to be excreted through the bladder as urine. Blood circulates through two kidneys which act as a filtration system and surplus fluid and waste pass down to the bladder through the ureters.




## The nervous system

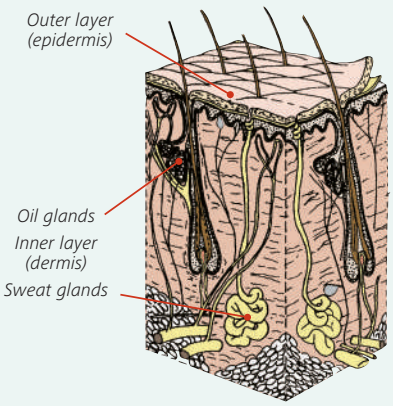
The brain and spinal cord are the main parts of the central nervous system. The brain processes information and has many separate functions including the automatic control of breathing, heartbeat and body temperature.

The spinal cord consists of nervous tissue, which carries messages to and from the brain. Sensory nerves carry information about heat, cold, pain etc. to enable the brain to coordinate a response. Motor nerves carry information about movement and the coordination of physical activities.




## The skin

The skin is the largest organ in the body. It provides shape and a covering for the bony and soft tissues of the body. The skin protects the body from infection and helps with temperature control by sweating in hot conditions and shivering when it is cold.

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# Glossary of terms

**Abdomen:** the area below the chest, extending to and including the pelvis, which contains the organs of digestion

**Abrasion:** a wound caused by scraping or rubbing

**Absorb:** to take in fluids or gases through the tissues

**Adrenaline:** a drug used in the emergency management of various life-threatening conditions, including a severe allergic reaction.

Adrenaline in an auto-injector device is available in Australia in two strengths under the trade names of EpiPen® and Anapen.

**Airway:** the passageway for air from the mouth and nose to the lungs

**Allergic:** having an adverse reaction to a substance (e.g. bee/wasp sting) that does not normally cause an adverse reaction

**Alveoli:** air sacs in the lungs where gas exchange takes place

**Amputation:** the removal of a body part, e.g. finger, toe, arm, leg

**Anaerobic:** an organism such as tetanus that thrives without oxygen

**Anapen:** see Adrenaline

**Anaphylactic shock:** a severe allergic reaction to a foreign protein entering the body

**Angina (angina pectoris):** a heart condition caused by poor blood supply to the heart muscle resulting in chest pain which increases with activity or stress

**Antiseptic:** a chemical used to clean wounds and reduce the risk of infection

**Anus:** the outside opening of the bowel

**Artery:** a blood vessel taking blood to the body from the heart

**Aseptic Technique:** protection against infection by using a sterile approach to wound care

**Assessment:** to identify a victim's condition (injuries or illness) by observation, examination and questioning

**Asthma:** a condition that constricts the airway, causes congestion and reduces air flow in and out of the lungs

**Bladder:** an organ acting as a reservoir, e.g. urinary bladder (for urine), gall bladder (for bile)

**Blood pressure:** the force exerted by the blood against the walls of blood vessels; the force required to circulate the blood around the body

**Bowel:** that part of the digestive system which collects, stores and expels waste from the body

**Brachial pulse:** the pulse that can be felt in a baby on the upper arm, between the biceps and triceps muscle

**Breastbone (sternum):** the bone extending down the centre of the chest and connected to the rib cage

**Bronchi:** large air passages that divide from the windpipe into the left and right lungs

**Bronchioles:** small air passages that divide from the bronchi and lead to the alveoli

**Bruise:** a closed wound caused by a blow from a blunt object

**Capillaries:** the smallest of blood vessels through which oxygen and nutrients pass to the cells

**Carbon dioxide:** in the air breathed out during respiration

**Carotid pulse:** the pulse that can be felt over a carotid artery in the neck

**Cartilage:** part of the supporting tissues found in joints and between the vertebrae

**Cardio-pulmonary resuscitation (CPR):** the combination of rescue breathing and heart compression for the victim of cardiac arrest

**Cervical:** relating to the first seven vertebrae of the spine

**Chain of Survival:** a four-stage international approach to the emergency care of the victim of cardiac arrest that gives the best possible chance of survival

**Circulation:** the flow of blood around the body

**Cold pack:** a cold dressing that assists control of bruising and swelling and helps relieve pain

**Communicable disease:** a disease that may be transferred from one person or animal to another

**Concussion:** loss of balance, loss of memory, poor response, nausea and blurred vision associated with head injuries

**Convulsion:** a seizure of childhood usually associated with a high temperature

**CPR (Cardio-pulmonary resuscitation):** the combination of rescue breathing and heart compression for the victim of cardiac arrest

**Cranium:** the portion of the skull containing the brain, excluding the face and jaw

**Crater wound:** a large open wound where skin, fatty tissue and muscle have been torn away

**Defibrillation:** the use of an automated external defibrillator to restore normal heart rhythm.

**Dehydration:** the loss of fluid or moisture

**Diabetes:** disease caused by the inadequate production of insulin in the pancreas

**Diaphragm:** a large muscle, used in breathing, dividing the chest from the abdomen

**Dislocation:** where a joint has been pulled apart

**Disorientation:** confused in direction, and having an inability to function normally

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# GLOSSARY OF TERMS



**Epilepsy:** a group of neurological disorders in which there is an electrical disturbance in the brain, often causing a seizure

**EpiPen®:** see Adrenaline

**Exhale:** the process of breathing out

**Extremities:** the fingers, toes, nose or ear lobes

**Faeces:** waste discharged from the bowel

**Fainting:** momentary loss of consciousness caused by insufficient blood supply to the brain

**Flammable:** easily set on fire

**Fracture:** a break in a bone

**Gall bladder:** an organ in the upper abdomen that stores bile

**Genitals:** the external organs of reproduction

**Gland:** any organ or group of cells that secrete specific substances

**Heat stroke:** a condition caused by overheating of the body to a level that endangers life

**History:** information of the incident gathered to identify how the injury or illness occurred

**Hyperglycaemia:** higher than normal levels of sugar in the blood

**Hyperthermia:** higher than normal body temperature

**Hypoglycaemia:** lower than normal levels of sugar in the blood

**Hypothermia:** lower than normal body temperature

**Immobilise:** to stop movement

**Incision:** a wound caused by a sharp edge

**Infection:** illness caused by the invasion into the body of pathogenic micro-organisms

**Inflammation:** swelling and redness of tissues as they react to infection, irritation or injury

**Inhale:** the process of breathing in

**Insulin:** a hormone released by the pancreas to assist cells to utilise sugar

**Intestine:** portion of the digestive system extending from the stomach to the anus

**Irrigate:** to flush with a continual flow of fluid

**Jaw support/jaw thrust:** methods used to open a victim's airway

**Larynx:** the structure at the top of the trachea that contains the vocal cords

**Laryngectomy:** the surgical removal of all or part of the larynx

**Ligament:** tissues that connect bone to bone at a joint

**Liver:** an organ in the upper right hand side of the abdomen which assists in digestion, and maintains normal blood sugar levels

**Lungs:** two organs in the chest where oxygen is absorbed into the blood and carbon dioxide is removed from the blood

**Mucous membrane:** the tissue that lines the respiratory and alimentary tracts

**Mucus:** a slippery and sticky secretion from mucous membranes that lubricates and protects some parts of the body

**Muscles:** tissues which perform movement by contracting and relaxing

**Nausea:** a feeling of the need to vomit

**Nerves:** bundles of fibres interconnecting the nervous system with the organs and other parts of the body

**Oesophagus:** the canal that extends from the pharynx to the stomach and carries food and fluids for digestion

**Organ:** different tissues grouped together in the body to perform specific functions

**Oxygen:** a colourless, odourless, tasteless gas essential to life, comprising approximately 21% of the air inhaled into the lungs during respiration

**Pancreas:** a gland in the upper portion of the abdomen that produces insulin and other digestive juices

**Pelvis:** the bones that support and protect the pelvic organs

**Pharynx:** the muscular tube at the back of the mouth and nose which joins the oesophagus

**Pressure Immobilisation Bandaging technique (PIB):** the application of a pressure bandage to delay entry of venom into the general circulation

**Pulmonary:** referring to the lungs

**Pulse:** expansion and contraction of an artery felt through the skin as the heart pumps blood

**Pupil:** the small black opening in the centre of the coloured part of the eye

**Recovery Position:** the safe and stable position for a breathing but unconscious victim

**Red blood cells:** part of the blood that carries oxygen to the tissues and returns carbon dioxide to the lungs

**Regurgitation:** the silent and passive emptying of the stomach in an unconscious victim with serious risks to the airway unless the victim is on the side

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SURVIVAL YouTube FIRST AID KIT iFIRST AID

**Rescue breathing:** a treatment for a non-breathing person to provide air by breathing into the victim

**Respiration:** movement of air in and out of the lungs
in breathing

**Response:** required to identify if a victim is conscious

**Resuscitation:** any effort to artificially restore or provide normal heart and/or lung function

**Seizure (convulsion, fit):** uncontrolled and unconscious muscle spasms

**Shock:** a failure of the body to maintain an adequate blood supply to all the organs and tissues following illness or injury

**Side-effect:** the unintended effects of taking a medication, drug or poison

**Signs:** the obvious indications of a victim's injuries or illness, e.g. skin colour, bruising, swelling, bleeding

**Skeleton:** the bony structure of the body that protects
and supports the soft organs and tissues

**Skull:** the bones of the head that surround and protect the brain

**Spasm:** abnormal, sudden and continuous muscle contraction

**Spinal cord:** the nervous tissue contained within the spinal bones (vertebrae) which carries messages to and from the brain

**Spleen:** the organ in the left upper abdomen that stores blood and destroys old blood cells

**Sprain:** an injury caused by over-stretching of the ligaments at a joint

**Sputum:** mucus which is expelled from the mouth

**Sterile:** containing no living micro-organisms

**Sternum (breastbone):** the bone extending down the centre of the chest and connected to the ribcage

**Stoma:** an artificial opening on the body surface e.g. laryngeal stoma after surgery to remove the larynx

**Stomach:** the organ in the abdomen that receives and breaks down food material

**Strain:** injury caused by over-stretching of a muscle or tendon

**Stroke:** the sudden cessation of circulation to an area of the brain, caused by a clot or bleeding

**Suffocation:** to die from lack of air

**Symptom:** what the victim feels from their injury or illness

**Tendon:** a fibrous band of tissue that attaches muscle to bone

**Tetanus:** a life-threatening infection which affects the nervous system following contamination of a wound with soil or dust particles carrying tetanus spores

**Tissues:** a group of cells that perform a special function, e.g. the lining of the mouth

**Torso:** that part of the body containing the chest, abdomen and pelvis

**Toxic:** to be poisonous

**Trachea:** the tube extending from the voice box to its division into the main bronchi, also known as the windpipe

**Trauma:** a physical or psychological injury

**Triage:** the process of assessing multiple victims to determine the priorities of care

**Unconsciousness:** a condition in which the victim fails to respond to the spoken word or a touch

**Urine:** a waste fluid filtered from the blood by the kidneys

**Vein:** a vessel that carries blood toward the heart

**Venom:** a poisonous fluid, which is produced by certain animals (e.g. snakes, spiders)

**Vertebrae:** the bones that comprise the spinal column

**Vomiting:** the forceful ejection of stomach contents through the mouth in a conscious person

**Vomitus:** the substance expelled from the stomach by vomiting

**White blood cells:** blood cells which fight off infection

**Windpipe:** the air passage between the larynx (voice box) and the main bronchi in the lungs

**Wound:** an injury that involves a break in the skin

## ACKNOWLEDGEMENTS

The publisher gratefully acknowledges the support of the following who provided photographs for this edition:

- Pratt Safety Systems, for the illustration of a safety shower
- Dr Michael Gray, for the Funnel Web and Red Back spider illustrations

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Adult Defibrillation
Child Resuscitation
Baby Resuscitation
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